Authority NND 735022

AAF TEST Section - INFANTRY BOARD

REPORT

of

The Infantry Board

No. 1538-B

LIGHT MACHINE GUN, T23E2

FORT BENNING, GEORGIA

21 OCT 1944

1079 BENNING 8-10-43 2,000

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IB-472.5

21 OCT 1944

Subject: Light Machine Gun T23E2.

To: Chief of Ground Requirements Section,
Army Ground Forces, Army War College,
Washington, D. C.

1. Authority, Background and Purpose. a. This Report is essentially a supplement to Report of The Infantry Board No. 1538 dated 30 November 1943, subject: "Light Machine Gun T23E1", since the subject gun, the Light Machine Gun T23E2 is the same weapon as there reported on with some minor modifications designed to overcome some of the faults previously reported, and to meet some of the recommendations submitted by agencies other than The Infantry Board.

b. Four of the subject guns were received for test (Guns Nos. 1, 3, 4 and 5) which differed from each other in minor respects as follows:

(1) Guns Nos. 1 and 5 are designed for selective firing as semi-automatic (shot by shot), slow-rate full automatic action, and fast-rate full automatic action. The cyclic rate-reducer mechanism is essentially the same as that of the standard Browning Automatic Rifle 1918A2, and is contained in the stock which is therefore necessarily as long as that of the Browning Automatic Rifle.

(2) Guns Nos. 3 and 4 have no cyclic rate reducer, and is therefore capable of only semi-automatic, (shot by shot) action and fast rate full automatic action. The stock is therefore shorter.

c. The important faults of the T23E1 gun, as reported previously, and which rendered that gun definitely unsatisfactory, were:

(1) Lack of tripod mounting adapters.

(2) Failure to function in rain and mud.

(3) Excessive breakage of parts.

(4) Cyclic rate too fast for accuracy when firing at the full automatic rate.

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d. Certain features not present in the T23E1 model are present in the subject gun, the most conspicuous of which were a flash hider and a kidney-shaped ammunition box attachable to the gun to avoid dragging the ammunition belt on the ground in action and during displacement with the gun loaded or half loaded. The subject gun is also fitted with a biped which differs from the biped of the standard Browning Automatic Rifle and of the Machine-gun, 1919A6, in that the outer or female portion of the telescoping extension leg is on the lower end, facilitating one-hand operation. (See Figures 1, 2, 3, 4, 5, 6, 7, 8, 15 and 16.

e. The purpose of the present test was to determine whether the above faults have been satisfactorily eliminated from the subject gun.

2. Facts Disclosed by Tests of the subject guns, covered in detail in the annexed Record of Test, are as follows:

a. The weights of the subject light machine guns T23E2 are slightly in excess of that of the T23E1, and are as follows complete:

Guns Nos. 1 and 5 - - - - 28.1 lbs.
Guns Nos. 3 and 4 - - - - 27.5 lbs.

(Test No. 1)

b. The subject guns involve no undue difficulty in stripping and assembling, and are approximately equal in this respect to corresponding standard weapons. (Test No. 3)

c. The operation of loading the subject guns is not different from that of the T23E1 gun, and is more involved and slower than that for the corresponding standard weapons. (Test No. 4)

d. The time required for putting the subject guns into and out of action is substantially equal to that for the T23E1 gun and for the corresponding standard weapons (Test No. 5)

e. The natural cyclic rate of the subject light machine guns is approximately eight hundred rounds per minute (800 rpm); with the cyclic rate reducer mechanism in operation the rate of Nos. 1 and 5 guns is approximately six hundred rounds per minute (600 rpm). (Test No. 6)

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f. The cyclic rate reducer mechanism of the subject guns Nos. 1 and 5 does not function reliably nor consistently. (Tests Nos. 6 and 16)

g. The average time required for changing barrels of the subject guns is 5.7 seconds, and the mechanism for effecting such change operates effectively and reliably. (Test No. 7)

h. The carrying handle of the subject guns is adequate for hand-carry when hot except that the center of support is forward of the center of balance of the gun rendering the load unbalanced and awkward, and that the hand-grip becomes too hot for the hand after prolonged firing. (Test No. 8)

i. The flash-hider of the subject guns is effective and adequate. (Test No. 10)

j. The box magazine (ammunition box, furnished with the subject guns)interferes slightly with the barrel locking handle, but functions otherwise effectively for the purpose intended. (Test No. 11)

k. The ammunition belt lifting power of the subject guns is adequate. (Test No. 12)

l. The accuracy and stability of the subject light machine guns in delivering full automatic fire are substantially equal to those of the corresponding standard weapons. (Tests Nos. 13 and 14)

m. The functioning of the subject guns in rain, spray or other conditions which result in the entry of water into the mechanism is unreliable and unsatisfactory. (Test No. 15)

n. The general functioning of the subject guns under normal operation is marred by excessive malfunctions and breakages, but the cause could not be definitely determined in the tests and may have been caused, at least in part, by the fact that all guns had been fired many thousands of rounds prior to their receipt by The Infantry Board. (Test No. 16)

o. The design of the bipod furnished with the subject guns is superior in convenience and ease of adjustment to the bipod of the present standard Browning Automatic Rifle and the Light Machine Gun M1919A6.

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3. Discussion. It is evident from the above results of test that the main objection found to the earlier model, T23E1, i.e., unsatisfactory functioning, especially in rain and spray, has not been remedied. The continued presence of that condition makes it impossible to consider the weapon satisfactory. The very substantial increase in weight, some five or six pounds more than the limit set in the approved military characteristics, cannot be wholly ignored, although it could be overlooked if the gun showed definitely superior performance characteristics, which it does not. It is apparent, too, that the excessively high cyclic rate is inherent in the design, and is probably one of the causes of erratic performance. It is realized that this may be due, in part at least, to the attempt to incorporate belt feed, which throws an excessive burden on the gun during the rearward movement of the bolt, and necessitates such violence of action and speed of moving parts that the inertia of the cartridge becomes an adverse factor. It may be advisable to reconsider the requirement for belt feed, if a suitable box magazine of adequate capacity can be provided.

4. Conclusions. The Infantry Board Concludes:

That the subject Light Machine Gun T23E2 is, in its present state, unsuitable for Infantry use as a light machine gun.

5. Recommendations. The Infantry Board Recommends:

That the subject Light Machine Gun T23E2 be not adopted as standard.

For the President:

INGEMAR M. OSETH,
Colonel, Infantry,
Director.

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RECORD of TEST

ON

LIGHT MACHINE GUN, T23E2

TEST SECTION
THE INFANTRY BOARD

FORT BENNING, GEORGIA

TO: THE DIRECTOR, THE INFANTRY BOARD.
HEREWITH DETAILED RECORD OF TESTS RELATING TO THE ABOVE PROJECT.

WILLIAM P. O'NEAL, Jr.,
Major, Infantry,
CHIEF, TEST SECTION

8 Copies.

Copy No. 6

Date 2 September 1944

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TEST SECTION
THE INFANTRY BOARD
FORT BENNING, GEORGIA

2 SEPTEMBER 1944

SUBJECT: REPORT OF TEST OF LIGHT MACHINE GUN, T23E2

TO: THE PRESIDENT, THE INFANTRY BOARD, FORT BENNING, GEORGIA

Authority NND 735022

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1. Authority and References.

a. Authority: Memorandum, The Infantry Board, IB-472.5, 15 July 1944, subject, "Light Machine Guns, T23E1 and T23E2". (Appendix "A")

b. References:

(1) Ordnance Committee Minutes No. 18197, 14 May 1942, subject, "Revision of Military Characteristics for a Light Machine Gun".

(2) Report of Test, The Infantry Board, No. 1155, subject, "Bipod and Shoulder Rest for Light Machine Gun, M1919A4".

(3) Report of Test, The Infantry Board, No. 1439, subject, "Johnson Light Machine Gun".

(4) Report of Test, The Infantry Board, No. 1440, subject, "Bren Light Machine Gun".

(5) Report of Test, The Infantry Board, No. 1538, subject, "Light Machine Gun, T23E1".

(6) "Notes on Materiel, Description of Guns, Light Machine, Caliber .30, T23E2", Springfield Armory, July 1944.

2. Introductory Information.

a. Captain C. H. Howell, O. D., arrived 16 July 1944 with 4 T23E2 Light Machine Guns. He departed 22 July. Capt. W. B. Sturtevant, O.D., arrived 25 July and departed 4 August. Capt. Howell arrived on a second visit 1 August and departed 5 August 1944. Tests were started 17 July 1944.

b. As described in Report No. 1538, The Infantry Board conducted tests on the Light Machine Gun, T23E1, in 1943. The gun described in the present report is basically the same as the T23E1, but because of minor differences, is known as the T23E2. The T23E1 was modified to the T23E2 as a result of tests conducted by The Infantry Board and other testing agencies.

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c. (1) (See Figures 1 - 17.) Four T23E2 light machine guns were submitted for test, Nos. 1, 3, 4, and 5. The four guns were not identical. Guns Nos. 1 and 5 were provided with rate reducing mechanisms and change levers permitting selection of single shot, slow or fast rates. Because of the rate reducing mechanism, the stocks on these guns were long.

(2) Guns Nos. 3 and 4 had short stocks and two rates of fire - single shot or fast rate.

(3) Gun No. 1 differed from the other three in minor details of construction. Thus parts and spare parts were not completely interchangeable.

d. (1) The T23E2 is a belt-fed, air-cooled light machine gun. It is provided with a bipod, stock and shoulder rest. It has provision for tripod or pedestal mounting.

(2) The mechanism of the gun is basically similar to that of the Browning Automatic Rifle. Since the gun is belt fed, certain additional parts are necessary to permit feeding from the belt.

(3) The gun feeds from the left side. It will operate with fabric belts or metallic link belts. The belt feeding mechanism is generally similar to that on the caliber .30 machine gun. In the T23, however, the belt is fed in near the bottom of the receiver, and the cartridge is lifted up in line with the chamber, whereas the reverse is true with the machine gun.

(4) The barrel can be quickly removed by lifting a lever on the right side of the receiver and sliding the barrel out forward.

(5) The gun fires from the open-bolt position, in the same manner as the BAR. The rate reducer, buffer and trigger groups are similar to those of the BAR. On guns Nos. 3 and 4, a change lever on the left side of the trigger group has settings for "safe", "single-shot" or "fast (basic) rate". Guns Nos. 1 and 5 have two change levers, one at the rear of the trigger group and one near the center of the group. When the rear lever is in the raised position, the other change lever has settings for "safe", "single shot" and "fast" rates. When the rear lever is in the lowered position, the front lever has settings for "safe", "slow" and "fast" rates.

e. While the subject guns are called "T23E2" and the guns previously tested were called "T23E1", there appears to be little basic difference between the two. Receivers and actions are practically the same. All four receivers and actions have been fired a considerable number of rounds. Gun No. 4 was fired approximately 13,000 rounds in the previous Infantry Board test.

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4570-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

Showing Right Side View Copy 45120-17

Figure 1

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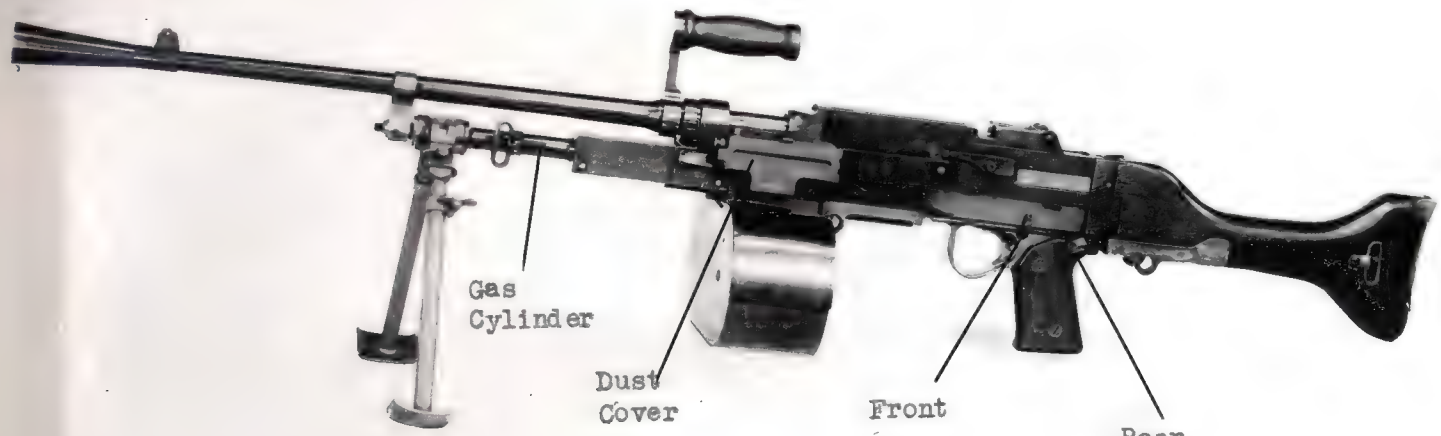

Figure 2

4571-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

Showing Left Side View

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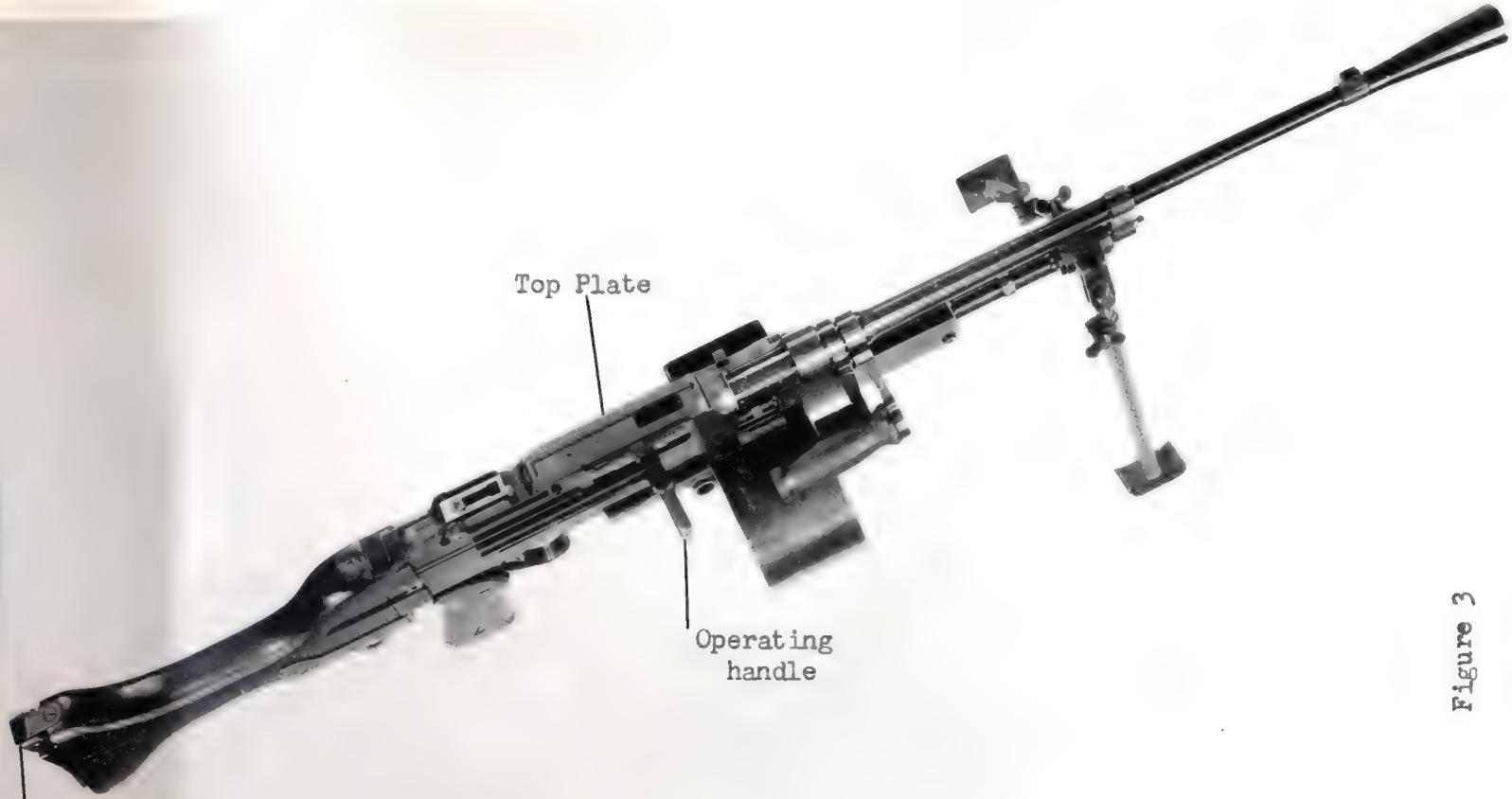
Authority NND 735022



4572-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

Showing Top View

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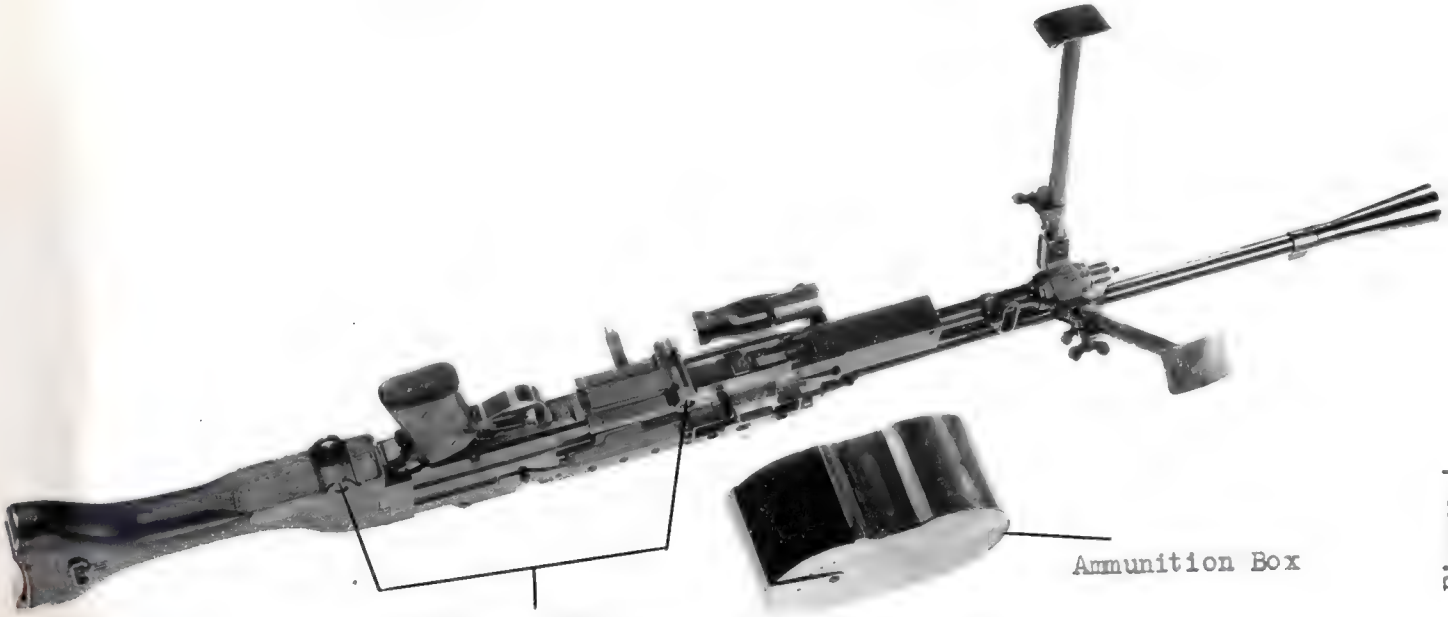
Figure 3

Authority NND 735022



4573-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

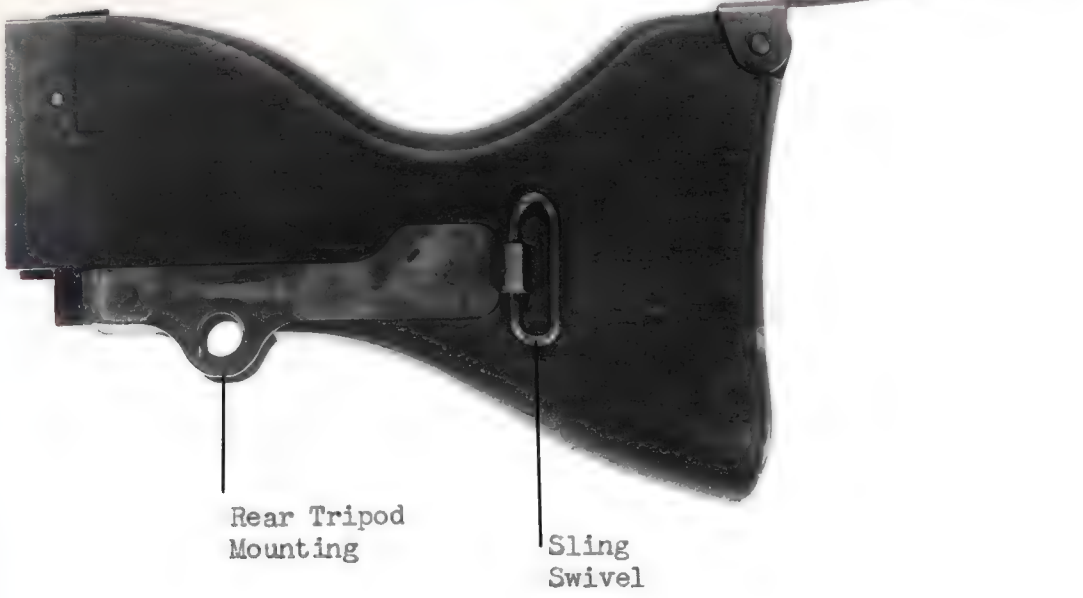
T-23 E2 LIGHT MACHINE GUN CAL..30

Showing Bottom View

Copy 45120-2

Figure 4

Authority NND 735022



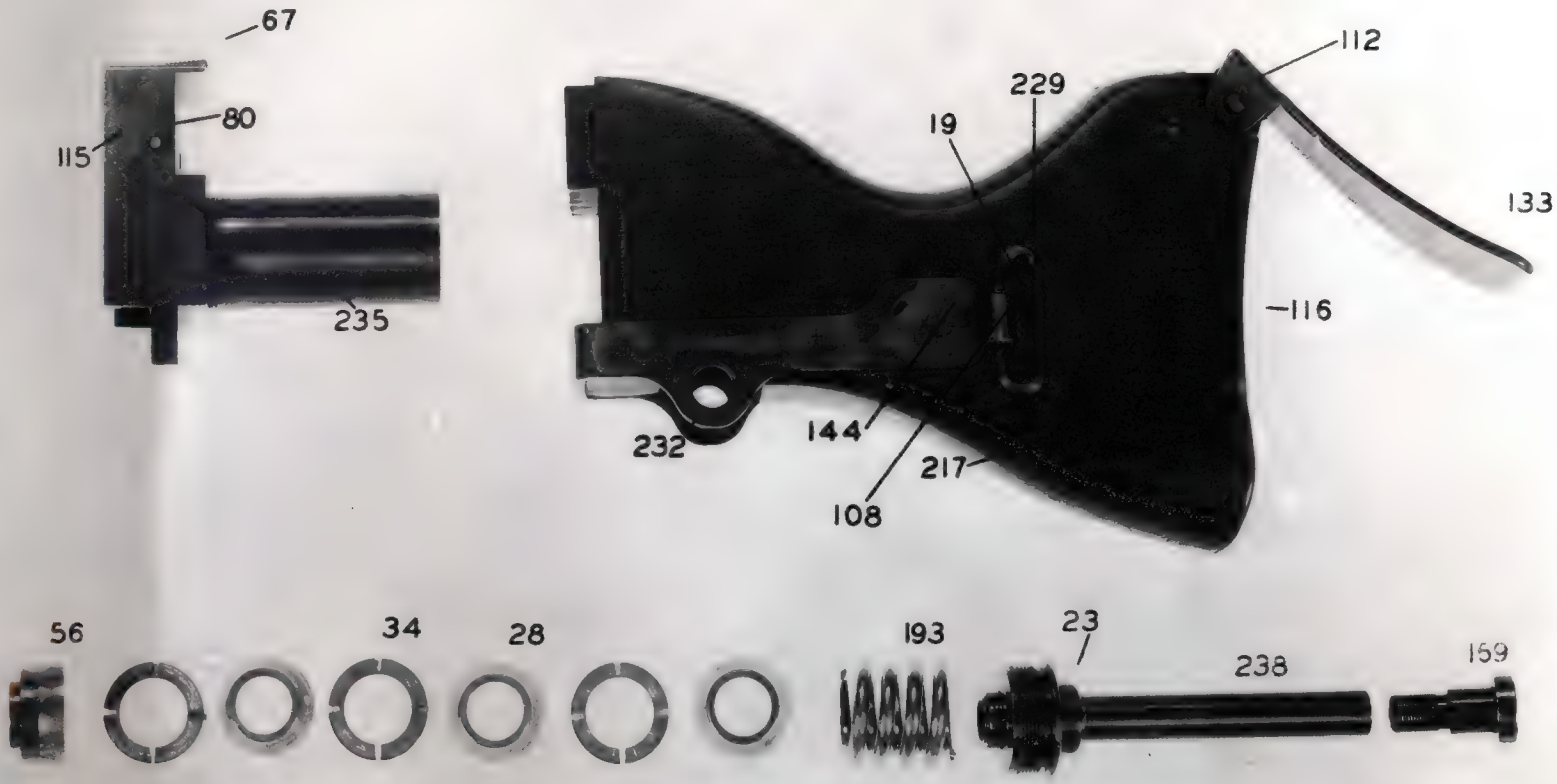
4583-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

Showing Left Side View of SHORT STOCK Assembly Copy 45120-5

Figure 5

Authority NND 735022



4584-SA

SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

STOCK, Butt Group Parts w/o Rate Reducing Mechanism

Figure 6

Authority NND 735022

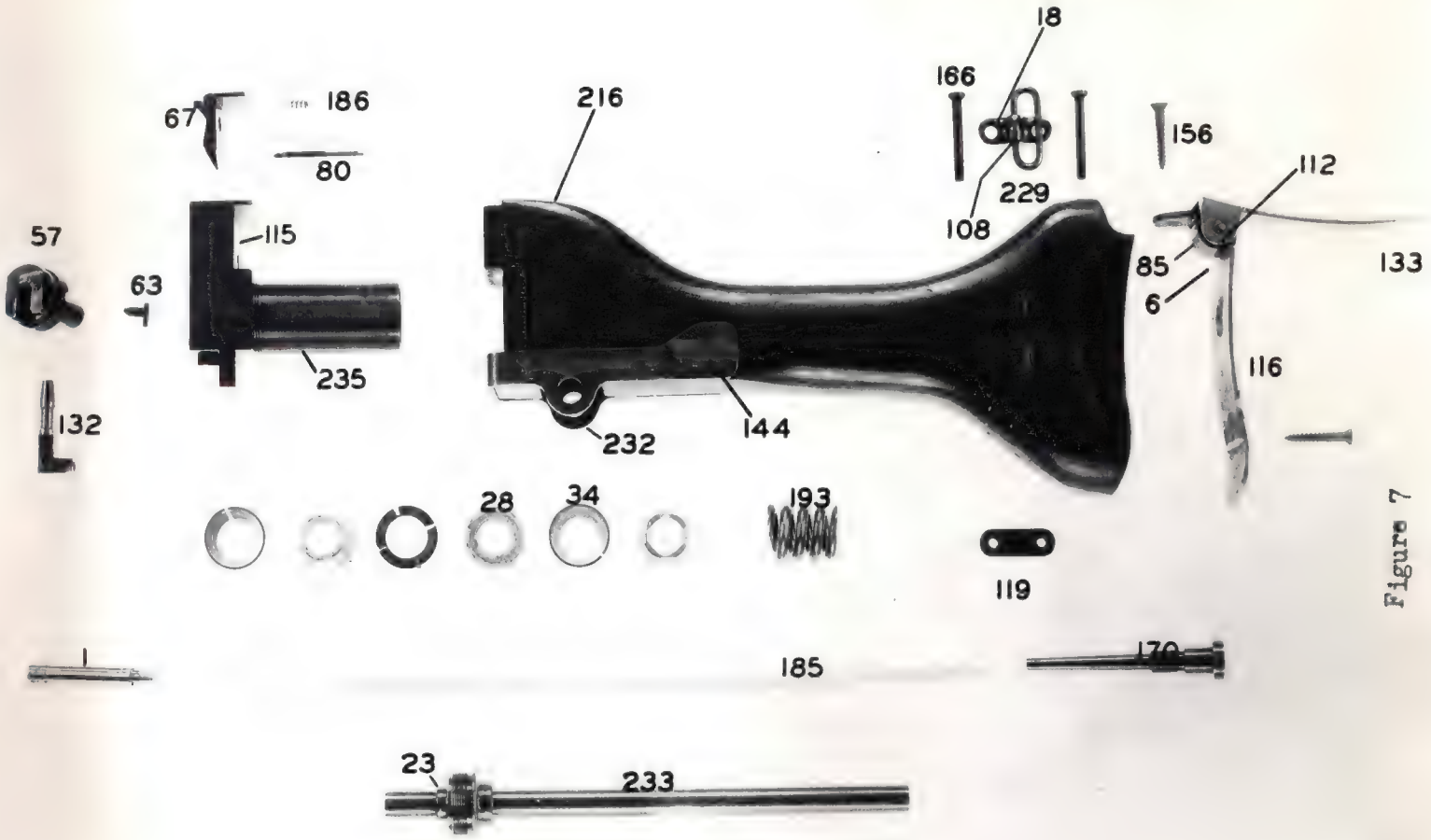


Figure 7

4574-SA

SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

STOCK, Butt Group Parts

Authority NND 735022

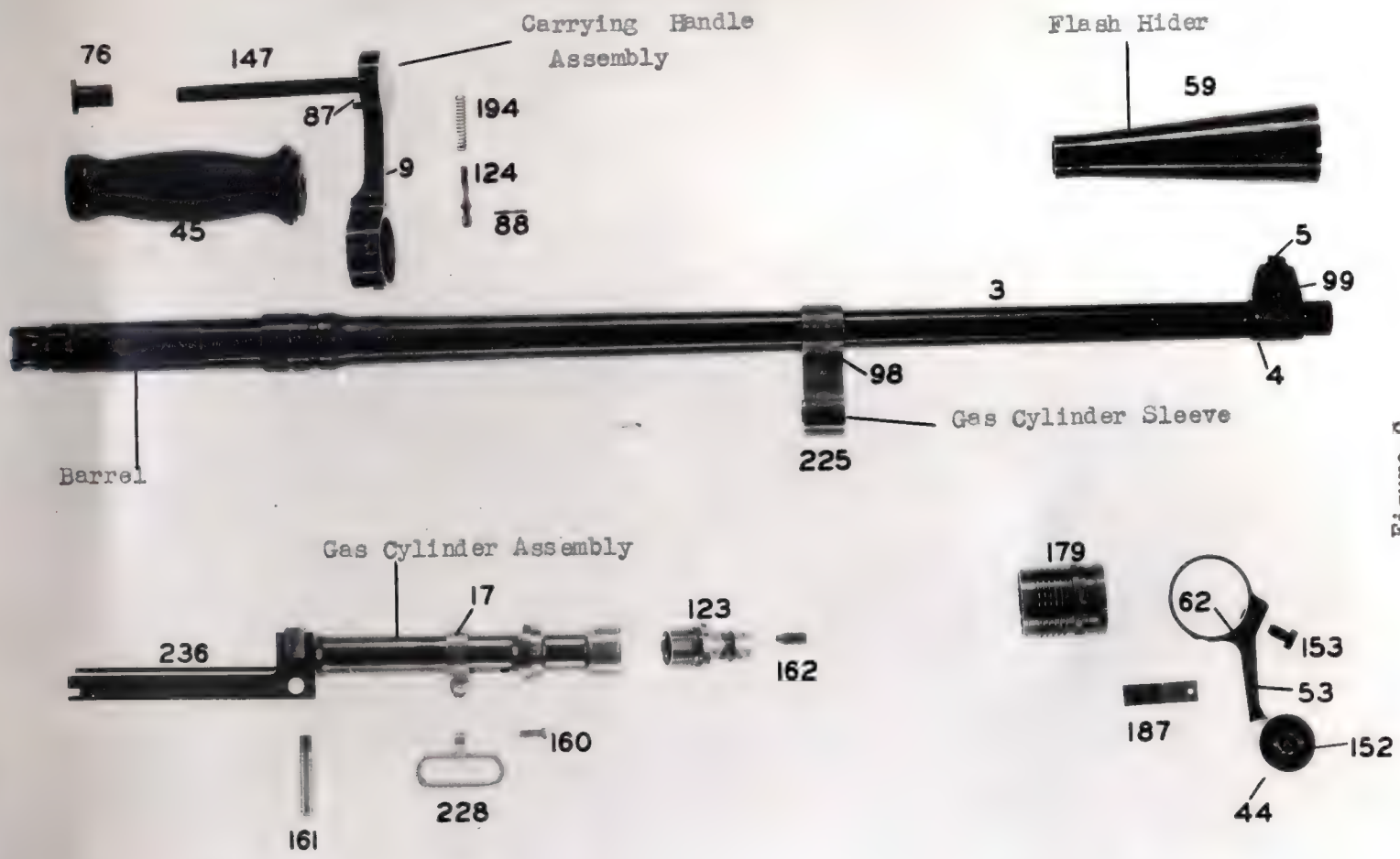


Figure 8

4580-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

BARREL; TUBE, Gas Cylinder and HANDLE, Barrel Locking - Group Parts

45120-14

Authority NND 735022

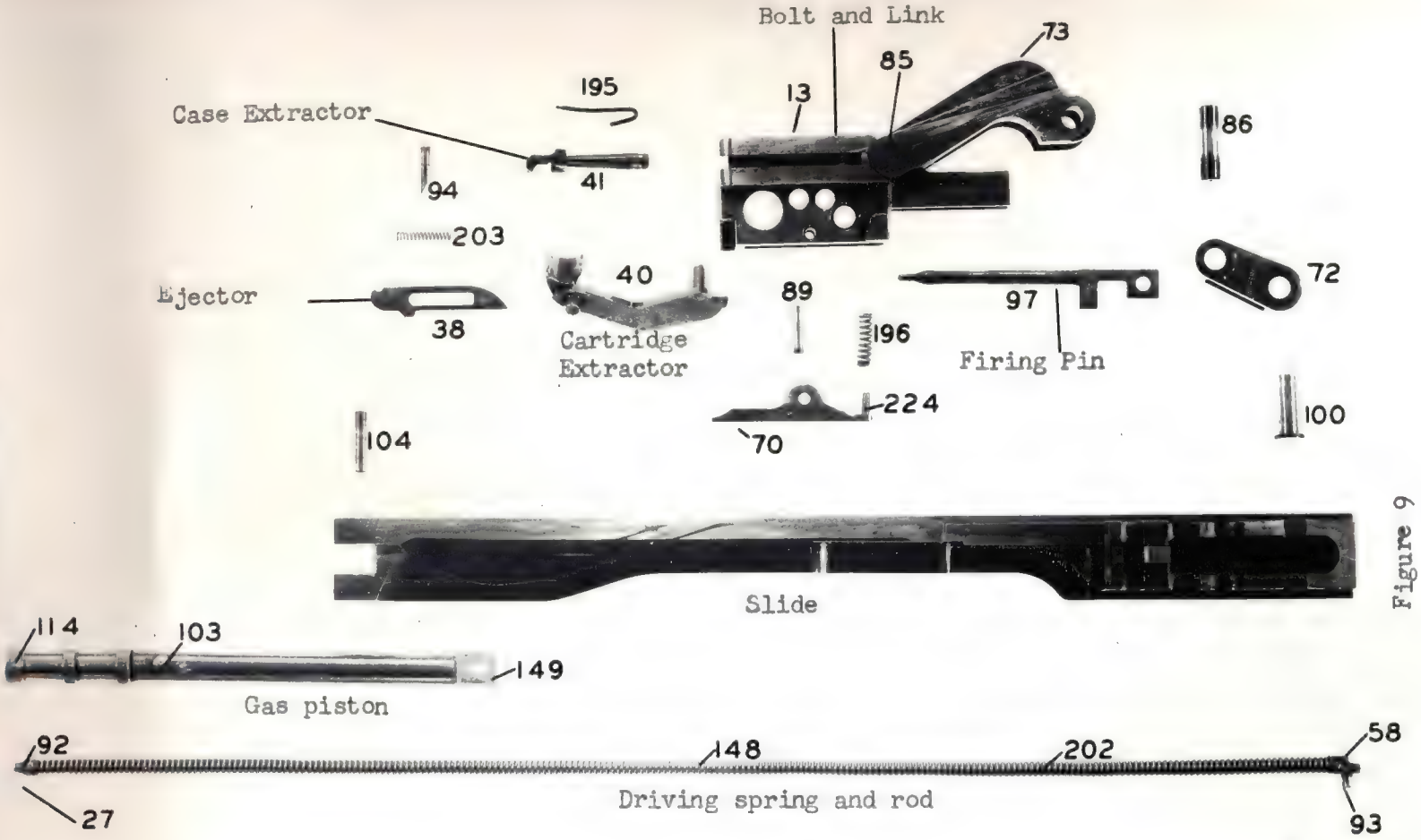


Figure 9

4575-SA

SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

BOLT and SLIDE, Operating - Group Parts

Authority NND 735022

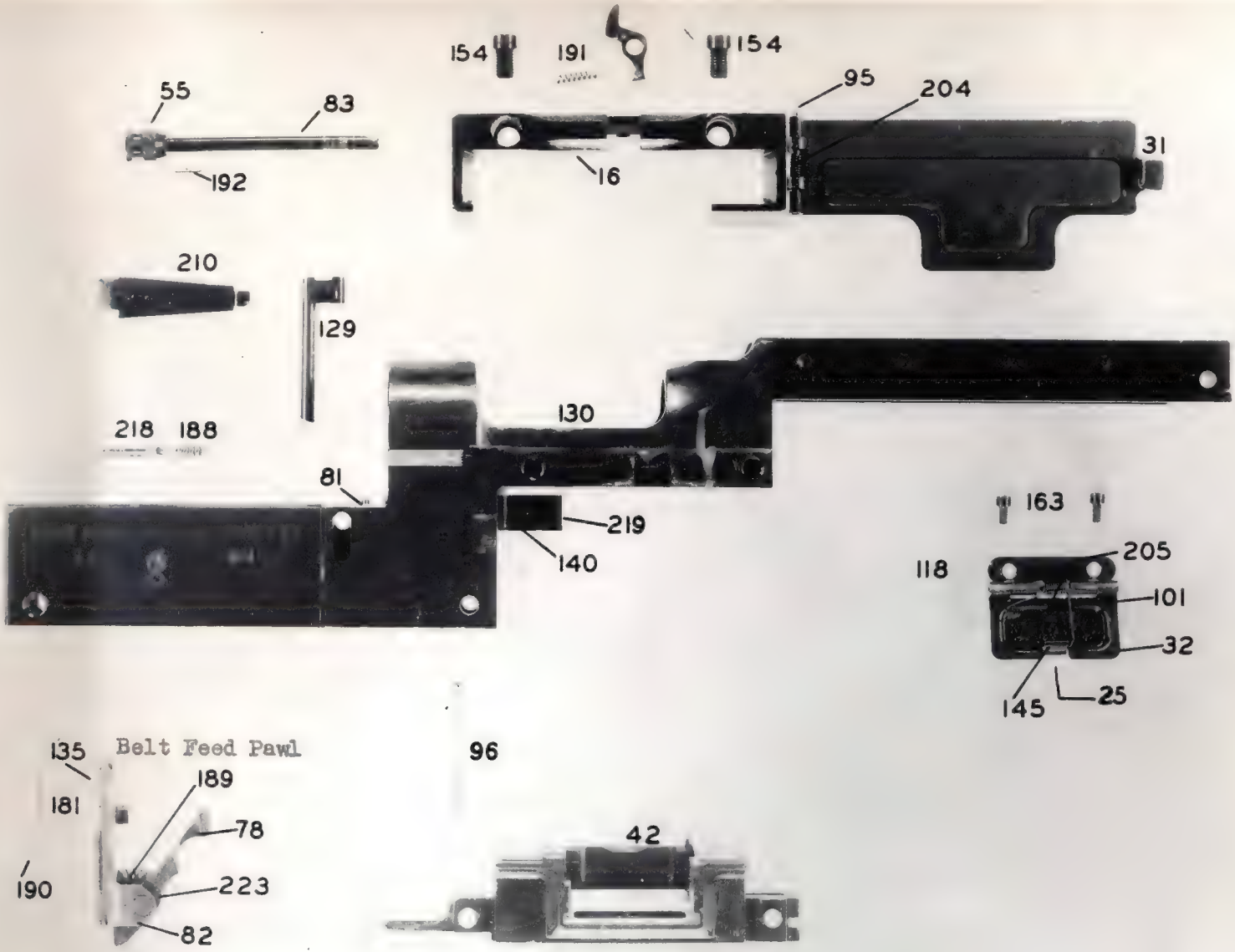


Figure 10

4576-SA

SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

RECEIVER Group Parts and FEEDWAY

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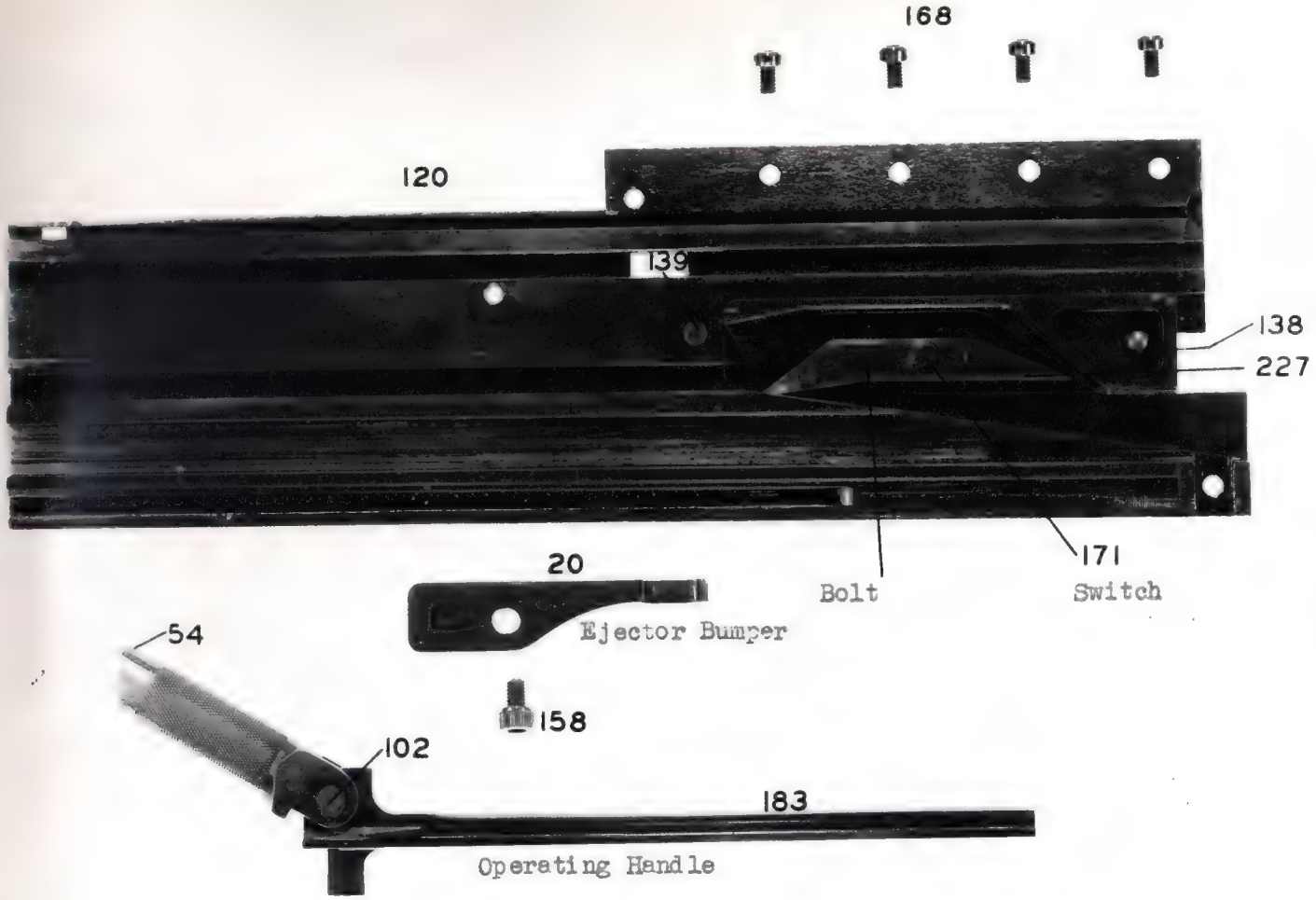

Figure 11

SPRINGFIELD ARMORY - ORDNANCE DEPT.

T-23 E2 LIGHT MACHINE GUN CAL..30

Showing PLATE, Side, L.H. Assembly and HANDLE, Operating Assembly

45120-9

Authority NND 735022

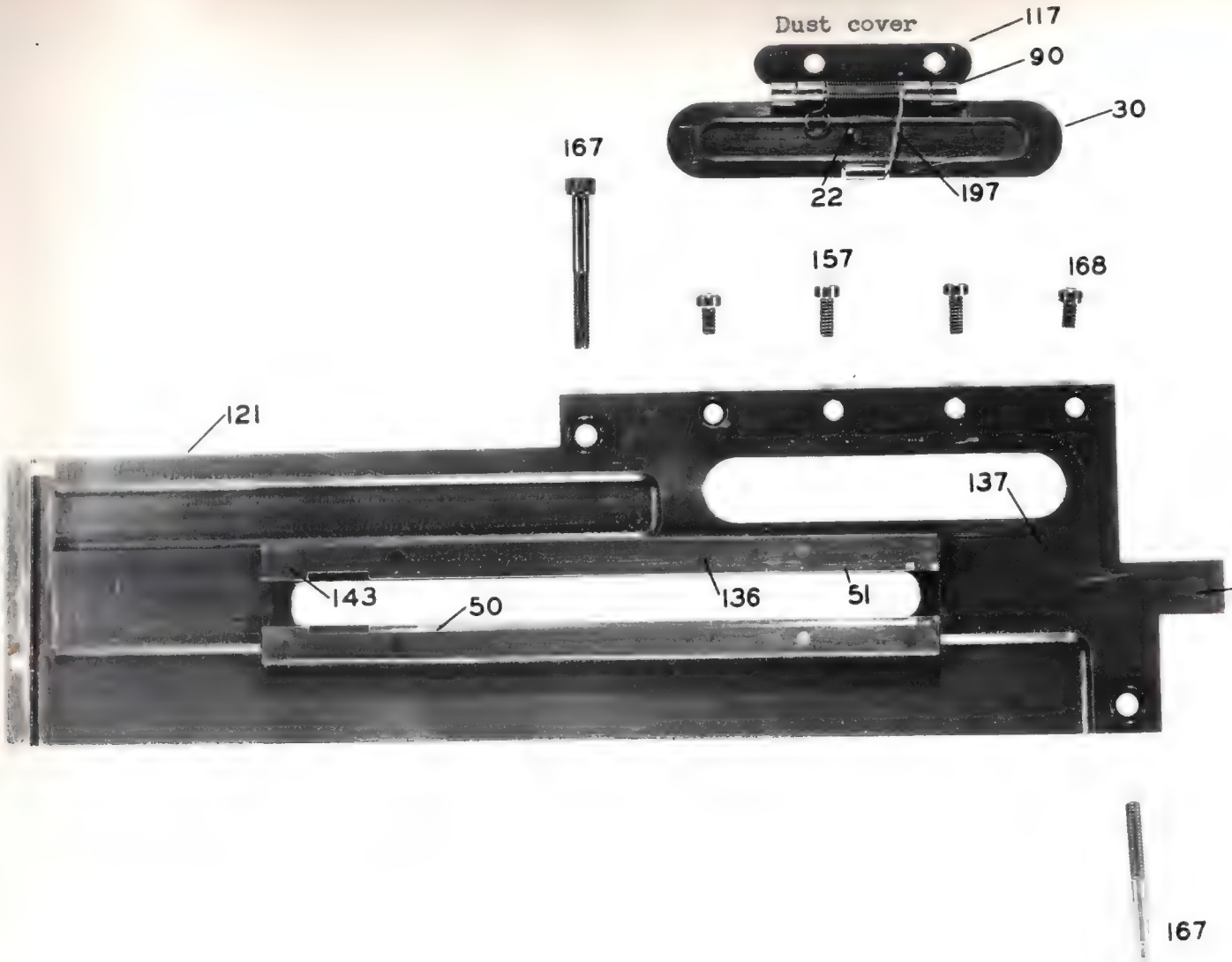

Figure 12

4578-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

PLATE, Side, R.H. and COVER, Case Ejection Port - Group Parts

Copy 45120-16

Authority NND 735022

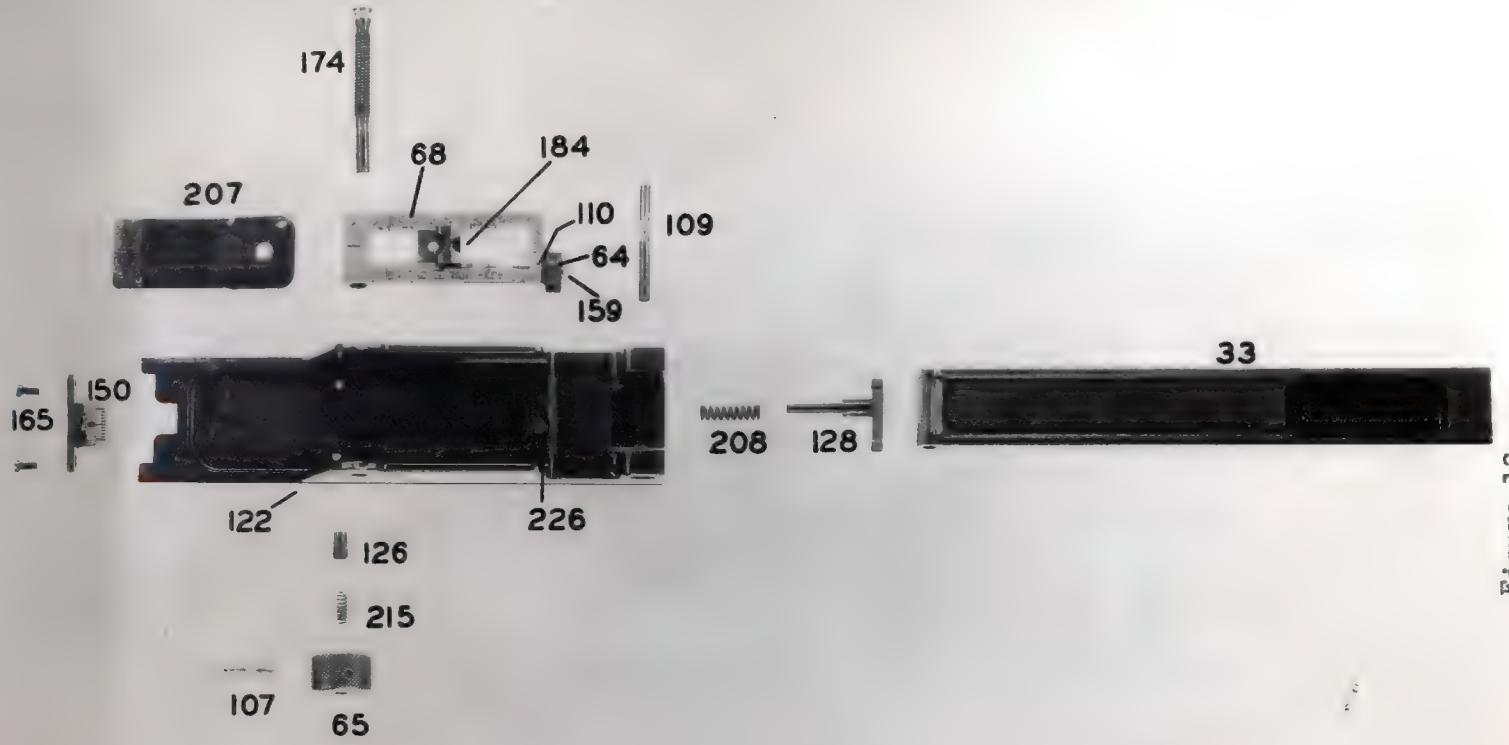

Figure 13

4585-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

PLATE, Top and COVER - Group Parts

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Figure 14

4577-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

GUARD, Trigger Group Parts

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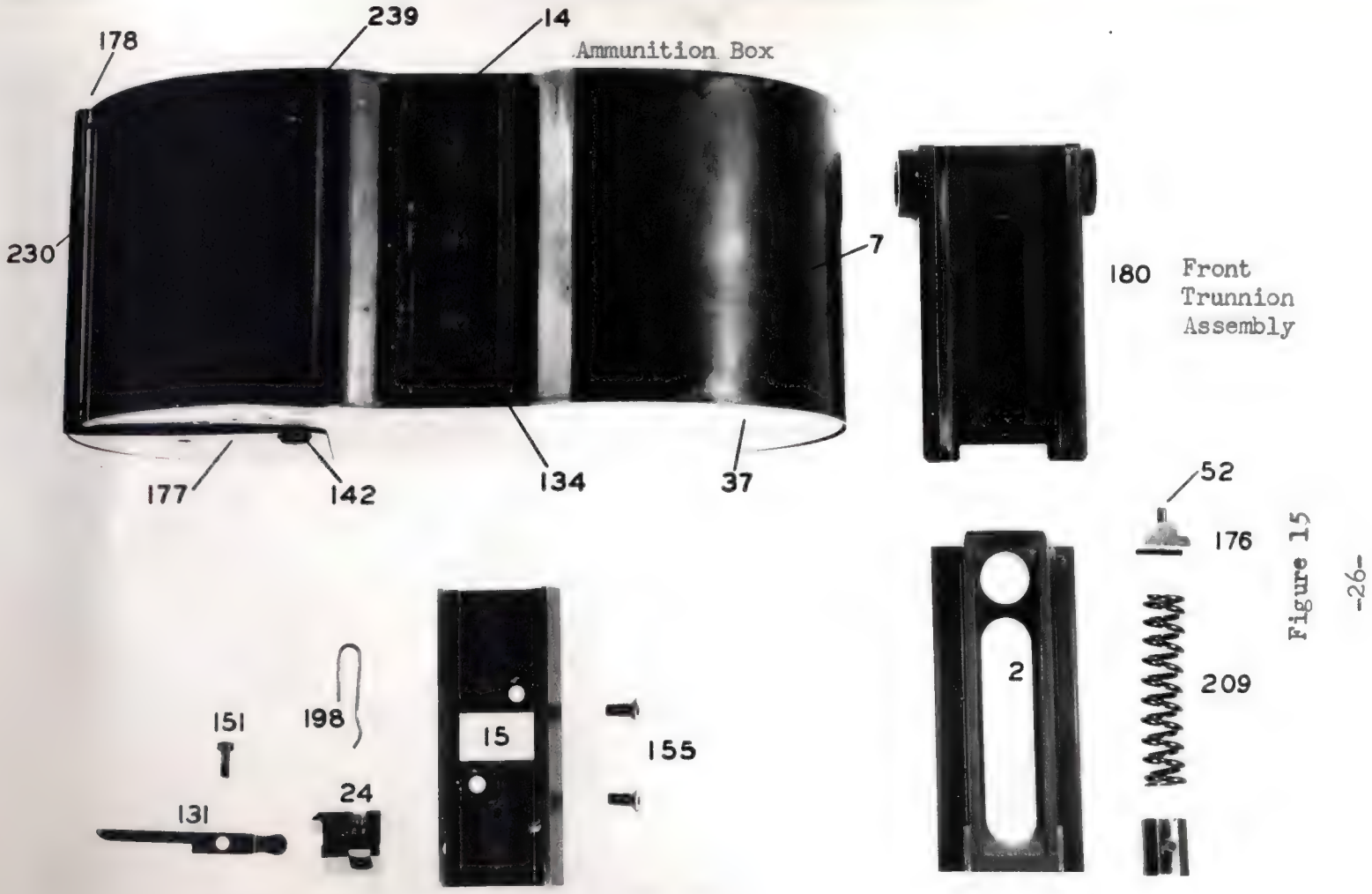

Ammunition Box retainer

Figure 15

4581-SA

SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30

BOX, Ammunition Assembly; RETAINER, Ammunition Box; and TRUNNION, Front - Group Parts

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Figure 16

4582-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944

T-23 E2 LIGHT MACHINE GUN CAL..30
BIPOD Group Parts

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4586-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 30 June 1944
T-23 E2 LIGHT MACHINE GUN CAL. .30
Showing TOOL, Combination
COPY 45120-1

Figure 17

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3. Purpose of Test.

Purpose of this test is to determine:

a. Physical characteristics.

b. Materials of construction of components.

c. Cyclic rates.

d. Normal fire capacity of barrel.

e. Functioning under various conditions.

f. Accuracy.

g. Ease of assembly and disassembly.

h. Suitability for tripod and pedestal mounting.

i. Adequacy of sighting system.

j. Belt lift.

k. Ease of hand carriage when hot.

l. Effect on accuracy of fast and slow rates.

m. Functioning of semi-automatic mechanism.

n. Other pertinent data.

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4. Details of Tests and Results.

Test No. 1

a. Purpose: To determine physical characteristics of the T23E2.

b. Method: Reference to "Notes on Material, Description of Guns, Light Machine, Caliber .30, T23E2", Springfield Armory, July 1944, and by weighing.

(1) Weights, pounds,

	From "Notes on Material"	Weighed by test personnel
Gun complete, including bipod and empty ammunition box		
Guns Nos. 1 and 5, long stock	26.78	
Gun No. 1, including sling and flash hider		28.1
Guns Nos. 3 and 4, short stock	26.65	
Gun No. 3, including sling and flash hider		27.5
Gun complete, including bipod, but without ammunition box		
Guns Nos. 1 and 5, long stock	25.00	
Gun No. 1, including sling and flash hider		26.2
Guns Nos. 3 and 4, short stock	24.87	
Gun No. 3, including sling and flash hider		25.6
Empty ammunition box	1.78	1.8
Ammunition box loaded with 100 rounds in metallic links	6.38	
Bipod	2.25	
Barrel assembly	4.16	
Barrel assembly with flash hider (No. 2 barrel)		4.6
Barrel assembly without flash hider (No. 6 barrel)		4.2
Barrel	3.42	
Flash hider	0.75	
Sling	0.5	0.5

(2) Length, inches,

Overall length of gun, including flash hider	
Guns Nos. 1 and 5, long stock	51.13
Guns Nos. 3 and 4, short stock	47.94
Barrel assembly, including flash hider	28.23

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Test No. 2

a. Purpose: To determine materials of construction of subject weapons.

b. Method: Study and examination.

c. Results:

(1) All parts of the T23, BAR and M1919A6 are made of various types of steel, except the parts listed below:

(a) T23:

Stock ——————— made of wood,
Buffer ——————— part of the assembly consists of 4 brass cups,
Carrying handle ——— made of wood,
Barrel locking handle — made of fiber,
Pistol grip ——————— made of wood.

(b) BAR:

Stock ——— made of wood,
Buffer ——— part of the assembly consists of 4 brass cups,
Forearm ——— made of wood.

(c) M1919A6:

Buffer ——————— may have fiber discs,
Carrying handle —— made of wood.

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Test No. 3

a. Purpose:

(1) To determine comparative ease of disassembly and assembly of subject weapons (Field stripping).

(2) To determine time necessary to instruct untrained men in disassembly and assembly of the weapons.

b. Method:

(1) Disassembly and assembly of the subject weapons were explained and demonstrated to men who had no previous training with the particular weapon.

(2) The men were allowed to disassemble and assemble the weapon three times for familiarization.

(3) The men were timed the fourth time that they accomplished the disassembly and assembly of the weapon.

(4) To provide a basis for comparison, time was recorded for men who were expert in disassembly and assembly of subject weapons.

(5) Since the M1919A4 and the M1919A6 Machine Guns are identical as regards mechanical training, the data on the former will apply for both.

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c. Results: The following data are copied from Report 1536, inasmuch as the T23E1 and the T23E2 are practically identical in these respects.

"(1) Summary of results:

Gun	Untrained men Average time to Disassemble (Seconds)	Untrained men Average time to Assemble (Seconds)	Trained men Average time to Disassemble (Seconds)	Trained men Average time to Assemble (Seconds)
T23	72	145	47	97
BAR	125	204	80	112
M1919A4	111	208	55	65
(2) T23	57	140	48	102
	64	138	46	92
	70	165		
	64	120		
	105	160		
Average	72	145	47	97
(3) BAR	115	180	87	120
	115	172	73	105
	200	365		
	101	124		
	92	131		
	129	255		
Average	125	204	80	112
(4) M1919A4	125	166	94	115
	120	161	59	60
	116	152	55	55
	123	163	54	62
	75	118	41	54
	106	132	28	44
Average	111	148	55	65

(5) A study of the above figures shows that men with little training could disassemble and assemble the T23 faster than the BAR or M1919A4. An expert could strip and assemble the T23 faster than the BAR and could strip the T23 faster than the M1919A4, but took a little less time assembling the M1919A4. The differences are not great, however, and the figures merely indicate that no particular difficulty is encountered in stripping and assembling the T23.

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(6) From observation of time necessary to teach men to strip and assemble the T23, it is apparent that these operations may be taught in approximately the same time as necessary with the BAR."

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Test No. 4

a. Purpose: To study the operations necessary in loading and unloading.

b. Method: Study and trial.

c. Results:

(1) T23 - loading.

(a) Starting with the bolt CLOSED, dust covers closed and gun empty, the following steps are necessary to load the gun:

1. Pull the bolt to the rear.

2. Insert the belt from the left side of the receiver, push open the right hand feedway cover with the metal tab and give the belt a pull to the right to insure seating a cartridge behind the belt feed pawl.

3. Pull the trigger.

4. Pull the bolt to the rear.

5. Fire.

(b) Starting with the bolt OPEN and the gun empty, the following steps are necessary to load the gun:

1. Insert the belt from the left side of the receiver and give it a pull from the right side to insure seating a cartridge behind the belt feed pawl.

2. Pull the trigger.

3. Pull the bolt to the rear.

4. Fire.

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(c) Unloading: Starting with the bolt OPEN and the gun loaded, the following steps are necessary to unload the gun:

1. Pinch the belt feed pawl and the belt holding pawl between two fingers.

2. Pull the belt out to the left.

3. Grasp the bolt handle with the right hand and pull the trigger with the left hand.

4. Let the bolt go partially home, then pull it smartly to the rear.

5. Pull the trigger.

6. Press the dust covers into place.

(d) Unloading: Starting with the bolt CLOSED and a loaded belt in the feedway:

1. Pull the bolt handle to the rear.

2. If a cartridge is held by the bolt, then proceed as in (c) above.

3. If no cartridge is held in the bolt:

Pinch the belt feed pawl and the belt holding pawl between two fingers.

Pull the belt out to the left.
Pull the trigger.
Press the dust covers into place.

(e) It should be noted that the belt can be fed into the feedway with the bolt open or closed, but that it can be removed only when the bolt is open.

(2) BAR.

(a) Loading: Starting with the bolt CLOSED and the gun empty, the following steps are necessary to load:

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1. Pull the bolt to the rear.

2. Insert the magazine.

3. Fire.

(b) Loading: Starting with the bolt OPEN, the following steps are necessary to load:

1. Insert magazine.

2. Fire.

(c) Unloading: With the bolt CLOSED and a loaded magazine in the receiver, the following steps are necessary:

1. Remove the magazine.

(d) Unloading: Starting with the bolt OPEN and a loaded magazine in the receiver, the following steps are necessary:

1. Remove the magazine.

2. Pull the trigger.

(3) M1919A6 and M1919A4.

(a) Loading: Starting with the bolt CLOSED and the gun empty, the following steps are necessary to load the gun:

1. Insert the belt from the left side of the receiver and give it a pull from the right side to insure seating a cartridge behind the belt feed pawl.

2. Pull the bolt handle to the rear and release it.

3. Again pull the bolt handle to the rear and release it.

4. Fire.

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(b) Unloading: Starting with the gun LOADED, the following steps are necessary:

1. Raise the cover.
2. Pull the belt out to the left.
3. Pull the bolt handle to the rear and release it.
4. Lower the cover.

(c) Unloading: Starting with a LOADED belt in the receiver, but no cartridge in the chamber, the following steps are necessary:

1. Raise the cover.
2. Pull the belt out to the left.
3. Lower the cover.

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Test No. 5

a. Purpose: To determine comparative times necessary to put guns into action and take them out of action.

b. Method:

(1) Step 1: On command, the gun crew picked up equipment from the ground, moved forward 5 yards, put the gun into action and fired one shot.

(2) Step 2: On further command, man took the gun out of action, moved forward 5 yards, put the gun into action and fired one shot.

(3) Step 3: On further command, man took the gun out of action, moved to the rear 5 yards and grounded equipment.

(4) Time was taken from the command until the shot was fired or the equipment grounded in the last step.

c. Results: (1) The following data are taken from Report 1538 inasmuch as the T23E1 and the T23E2 guns are practically identical in this respect:

"(a) Bipod legs were folded to begin with, and were folded each time the gun was taken out of action and extended each time the gun was put into action.

(b) A three-man crew was used on the T23, M1919A6 and M1919A4.

(c) A two-man crew was used on the BAR.

	Average time, seconds,			
Step No.	T23	BAR	M1919A6	M1919A4
1	23	26	26	19
2	34	33	36	31
3	22	23	21	19
Total	79	82	83	68 "

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(2) The following table shows times taken as indicated in (1) above, except that:

"(a) Biped legs were extended before the start of the test.

(b) Two-man crews were used on the T23 and M1919A6.

(c) One-man crew was used on the BAR.

	Average time, seconds		
Step No.	T23	BAR	M1919A6
1	13	14	14
2	21	17	21
3	10	9	11
Total	44	40	46"

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Test No. 6

a. Purpose: To determine cyclic rate of subject guns.

b. Method: Time was kept while the gun fired a counted number of rounds. Rounds per minute were calculated by the formula

$$RPM = \frac{\text{rounds fired}}{\text{time, sec.}} \times 60$$

c. Results:

(1)

Gun No.	Rate	Rounds fired	Time	Rounds/minute	
1	Fast	47	3.6	783	
1	Fast	53	3.9	815	
3	Fast	25	2.1	715	
3	Fast	25	2.0	750	
3	Fast	20	1.5	800	
1	Fast	99	8.0	743	Port open 1/4 turn
3	Fast	25	2.2	683	Port open 4 turns
1	Fast	74	5.9	752	Port open 4 turns
3	Fast	20	1.4	859	
3	Fast	80	6.3	752	
5	Fast	33	2.5	792	
1	Slow	40	4.6	522	
1	Slow	39	3.8	615	
1	Slow	31	2.9	640	

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(2) Adding all the rounds fired and the time of firing at one rate with each gun, the following average rates of fire are obtained:

Gun No.	Rate	Rounds per minute	Total
1	Fast	800	100 rounds
3	Fast	750	368 rounds
5	Fast	792	33 rounds
1	Slow	583	110 rounds

(3) (a) It should be noted that the cyclic rate did not change materially on Gun #3 when the gas port was changed from 1/4 turn open (rate 743) to 4 turns open (rate 752).

(b) The figures for slow cyclic rate on #1 gun do not actually represent the slow cyclic rate. This gun gave erratic cadence throughout the test when set to slow rate. It would fire some shots slow rate and some shots fast rate during a string. The actual slow rate is something less than 583 rounds per minute.

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Test No. 7.

a. Purpose: To determine time necessary to change barrels on the T23.

b. Method: The barrel was removed and another barrel replaced in the gun. Time was taken for the operation. Study of barrel removal was made with the gun hot and cold.

c. Results:

(1) The following data are extracted from Report 1538, inasmuch as the T23E1 and the T23E2 do not differ in this respect:

"(1) Times (barrel cold)

Trial No.	Time, seconds
1	7.0
2	8.4
3	6.8
4	6.0
5	5.4
6	5.0
7	5.0
8	5.6
9	4.2
10	3.8 "
Average	5.7

(2) As received, nearly all barrels were difficult to remove after some firing. During the course of the test the gas cylinder sleeves were opened up by Capts. Howell and Sturtevant. In the latter portion of the test, practically no trouble was experienced removing barrels when hot or cold or after long periods of firing.

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Test No. 8.

a. Purpose: To determine ease of hand carry when the T23 is hot.

b. Method: Trial after various periods of firing.

c. Results:

(1) The following data are extracted from Report 1538, inasmuch as the T23E1 and T23E2 guns do not differ materially in this respect:

"(1) The gun can be successfully carried by hand after moderate amounts of firing.

"(2) After about 600 rounds at the rate of 125 rounds per minute, the wooden carrying handle was too hot to touch with the bare hand.

"(3) Care must be taken not to get the hand against the metal portions of the carrying handle when the barrel is hot. If the hand is slid forward against the metal handle support, a burn will result."

(2) The T23E2 has a carrying handle which affords more protection to the hand, particularly against sliding the hand forward against the metal portions as described in "(3)" above.

(3) The point of balance of the gun is behind the center of the carrying handle, which makes it a rather awkward one-man load.

(4) Sling swivels have been added, one on the gas cylinder and one on the stock, which permit carrying the gun slung over the shoulder (See Figure 18).

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Sling swivels have been added to the T23, permitting carrying it slung.

Figure 18

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Test No. 9.

a. Purpose: To determine adequacy of the sighting system.

b. Method: Study and observation of firing.

c. Results:

(1) The front and rear sights are the same as on the BAR M1918A2, except that no front sight guard is provided.

(2) The sighting system appears to be as satisfactory as that on the BAR.

(3) The front sight is mounted on the barrel, while the rear sight is mounted on the receiver. This may mean that the zero of the gun with one barrel mounted may be different from the zero with another barrel mounted.

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Test No. 10.

a. Purpose: To study the flash hider on the T23 gun.

b. Method: Study and observation of flash at night.

c. Results:

(1) Barrels No. 1, 3, 4 and 5 were equipped with a small, cone-shaped flash hider which screwed on the end of the barrel. The other 4 barrels did not have flash hiders and were not threaded for these hiders. (See Figures 1-4 and 8)

(2) The muzzle flash was observed at night, while firing tracer-ball and ball ammunition. A bright orange lamp chimney shaped flash was seen from the barrel without flash hider. When the flash hider was installed, this was eliminated, leaving only a small dull red streak, with occasional sparks. The results, from a hasty check, appeared to be approximately the same as from the Flash Hider T9 tested by the Infantry Board, insofar as hiding flash is concerned.

(3) Subject flash hider is a metal cone, threaded at the small end to fit the barrel. Length of the hider is approximately 4.8 inches. The included angle of the cone is approximately 10 degrees.

(4) It would appear desirable to test this type of flash hider on the BAR and other weapons.

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Test No. 11.

a. Purpose: To study the magazine provided with the T23.

b. Method: Examination and firing.

c. Results

(1) The magazine provided with the T23 was designed to hold approximately 100 rounds in fabric or link belt. It fits on the bottom of the gun, under the belt feed mechanism. The magazine has an opening through which the belt feeds. This opening is provided with a sliding cover.

(2) When the magazine was installed on the machine guns, it was necessary to file the rear portion of the barrel locking handles, so as to clear the magazine.

(3) One magazine could not be latched on 3 of the machine guns.

(4) Approximately 1200 rounds were fired from #3 machine gun feeding out of the magazine, without any malfunctions which could be traced to the magazine. The magazine stayed in place satisfactorily during this firing.

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Test No. 12.

a. Purpose: To determine belt lift of the T23.

b. Method: Gun #3 was mounted on an elevated platform. The loaded belt hung down. The number of rounds the gun would lift was noted.

c. Results:

(1) The gun successfully lifted 100 rounds in web belt. However, several feeding malfunctions were obtained: bolt closed on empty chamber and the belt fell out.

(2) The gun successfully lifted 125 rounds in web belt. However, several feeding malfunctions were obtained: bolt closed on empty chamber and the belt fell out.

(3) The gun successfully lifted 130 rounds in metallic links. However, several feeding malfunctions were obtained: bolt closed on empty chamber.

(4) No difficulty appeared to be encountered by the gun in lifting the amounts noted above. It is probable that the gun has sufficient power to lift greater lengths of belt.

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Test No. 13

a. Purpose: To determine accuracy which can be obtained by average soldiers.

b. Method: Groups were fired off shoulder at 1000" from the T23, the BAR and the M1919A6. Group sizes were measured and averages compiled. Firers ranged from men who had qualified as expert with the BAR or M1919A6 to men who had done little firing with this type of weapon. All new barrels were used on the T23 Guns. Barrels on the BAR's and M1919A6 were not new.

c. Results:

Accuracy, single shot

Gun	# groups	# shooters	Average Group size, inches Hor.	Vert.	Max.
T23 #1	25	12	2.2	2.7	3.2
T23 #3	30	13	2.4	3.0	3.4
T23 #5	14	5	1.9	2.6	2.9
Average of all firing with T23	69	xx	2.2	2.9	3.3
BAR	57	16	2.7	2.6	3.4
M1919A6	23	11	3.8	4.0	5.2

Accuracy, slow rate

Gun	# groups	# shooters	Average Group size, inches Hor.	Vert.	Max.
T23 #1	29	11	4.4	3.7	5.3
T23 #5	8	4	4.9	4.6	6.3
Average of all T23 firing	37	xx	4.5	3.9	5.5
BAR	53	17	4.9	3.6	5.6
M1919A6	36	12	4.5	4.6	5.8

Accuracy, fast rate

T23 #1	56	12	7.8	4.3	8.5
T23 #3	48	13	8.7	5.3	9.8
T23 #5	20	5	5.6	4.5	6.7
Average of all T23 firing	124	xx	7.8	4.7	8.7
BAR	109	17	6.3	3.7	7.0
M1919A6	52	12	5.9	5.0	7.3

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Test No. 14

a. Purpose: To determine suitability of the T23 for mounting on tripods.

b. Method: The T23 was mounted on the T88 and M2 tripods and studied. Some groups were fired.

c. Results:

(1) T88 Tripod: (See Figure 19)

(a) The T23 with the long stock could be mounted on the T88 tripod. The T23 with the short stock could not be mounted on this tripod because the under portion of the short stock struck the rear part of the mount cradle, so that the rear bolt could not be inserted. Only one of the four trigger groups could be used in conjunction with the firing mechanism of the tripod. The other three triggers were of a different shape and the tripod firing mechanism could not press them at the proper angle.

(b) When the tripod was mounted in the low position with the rear legs loose or folded forward, the front foot of the tripod would lift off the ground and stay in the air while firing bursts at the fast rate. When firing slow rate, the front feet appeared to settle to the ground between shots.

(c) The rear fitting on the gun was loose in the tripod mounting. For group firing, shims were made to tighten it up. The stock extends out beyond the rear of the tripod, so it is possible to fire the gun with the gunner leaning his shoulder into the stock if desired.

(d) The following is a summary of groups fired from this tripod:

Accuracy, T23 on T88 Tripod

Single shot

No. of groups	No. of shooters	Average group size, inches Hor.	Vert.	Max.
13	3	4.4	4.7	5.9

Fast rate

38	3	4.2	4.4	5.9

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(2) M2 Tripod: (See Figure 20)

(a) The T23 could be mounted on the M2 tripod, but the rear mounting had considerable side play where it was attached to the elevating mechanism. For group firing, washers and shims were inserted to reduce this play.

(b) On this tripod, the elevating mechanism must be mounted on the gun so that the traversing handwheel is on the right or traversing clamp on the front.

(c) The stock extends beyond the rear of the tripod, so that it is possible for the gunner to rest his shoulder against the stock if desired. The stock also interferes to some extent with ease of loading and laying.

(d) The following is a summary of groups fired from the M2 tripod:

Accuracy, T23 on M2 Tripod

Single Shot

No. of groups	No. of shooters	Average group size, inches Hor.	Vert.	Max.
8	2	3.2	2.9	3.8

Fast Rate

16	2	4.2	3.7	5.2

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The T23 on the T88 Tripod

Figure 19

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The T23 Mounted on the M2 Tripod

Figure 20

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Test No. 15.

a. Purpose: To determine functioning of subject weapons in rain.

b. Method: The gun was thoroughly cleaned and heavily oiled with light oil. Fifty rounds were fired to check functioning. The gun was then put under a spray simulating a heavy rain. Firing was attempted. A record was kept of rounds fired and malfunctions.

c. Results:

Except as noted, ammunition lot FA3817 was used.

During firing to check functioning, belts were dry.

During firing under rain, all belts were wet.

Unless otherwise noted, 50-round function test was fired without a stoppage.

(1) T23E2 #1.

rial #	Rds tried under spray	Number of malfunctions	First malfunction at round number	Remarks
1	50	44	5	19 Failures to eject in 1st 25 rounds. Gas port then opened three turns. 25 malfunctions in last 25 rounds.
2	25	25	1	In preliminary check firing, ejection was weak. 3 failures to eject with web belt, out of 25 rounds tried. With link belt, before putting gun in water got many short recoils, failures to feed and failures to fire. Gas port wide open. After above firing, gun cleaned and oiled and tried dry again: consistent weak ejection. 4 failures to eject, 1 bolt closed on empty chamber out of 50 rounds tried. After above firing, gun cleaned and oiled and tried dry again: consistent weak ejection. Changed ammunition and changed various parts, but weak ejection and short recoils continued.

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(2) T23E2 No. 3.

Trial No.	Rds. tried under spray	Number of mal-functions	First mal-function at round number	Remarks
1	67	67	1	After first 25 rounds, gas port opened 3 turns. 17 rounds link belt tried after 50 rounds in fabric belt.
2	50	50	1	Before water, 50 rounds in fabric belt and 25 rounds in link belt fired OK. Malfunctions in water mostly short recoil.
3	25	25	1	Before water, 50 rounds in fabric belt and 25 rounds in link belt fired OK. Malfunctions in water were short recoil. After this trial, and without cleaning, the action was coated with "lubriplate" as completely as possible without disassembly. 25 rounds were fired, giving 12 failures to eject, but with better functioning towards the last. The gun was then put under the spray with the following results:
4	25	25	1	
				The gun was then stripped and thoroughly coated with "lubriplate" on all working parts. It was put under the spray with the following results:
5	475	2	135	Gun then cleaned and oiled. Function checked Dry, then put under spray, with following results:
6	100	36	35	In last 25 rounds, 23 malfunctions. Most stoppages short recoil. Before water, 125 rounds fired without a stoppage.
				After above firing, "lubriplate" applied on belt link and shoulder and gun tried under the spray, with the following results:
7	25	14	5	Most malfunctions short recoil.
				After the above firing, gun was disassembled and all working parts thoroughly coated with "lubriplate". The gun was then put under the spray with the following results:
8	91	0	0	

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(3) T2352 No. 4.

Trial No.	Rds. tried under spray	Number of malfunctions	First malfunction at round number	Remarks
1	28	28	1	Prior to water, 50 rounds fabric belt fired OK. 42 rounds link belt fired with 3 short recoil, 1 bolt closed on empty chamber. Gas port then opened wide and gun put under water, with results as shown on the left. Malfunctions under spray short recoil. On next trial, before water, gun gave 5 failures to eject and consistent weak ejection in 31 rounds. Gun thoroughly cleaned and oiled. 50 rounds fabric belt and 25 rounds link belt tried before water. 1 failure to eject and still weak ejection. Gun then put under water spray with the following results:
2	26	26	1	10 rounds link belt and 16 rounds fabric belt tried. The gun was then dried and oiled and fired 25 rounds without a malfunction. A piece of canvas was laid over the barrel to keep water away from the front portion of the gas cylinder. The gun was then put under the spray, with the following results:
3	50	44	6	Malfunctions short recoil and failure to eject. Gun cleaned and oiled and 200 rounds fired without a malfunction. Gun then put under spray with the following results:
4	25	20	5	Gun was then "lubriplated" as well as possible without stripping, put under the spray with the following results:
5	25	25	1	

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(4) T2382 No. 5.

Trial No.	Rds. tried under spray	Number of mal-functions	First mal-function at round number	Remarks
				In preliminary firing of 50 rounds, wet belt was used. One failure to eject.
1	25	25	1	At conclusion of this 25 rounds, gas port was opened wide and 25 rounds fired without the spray on the gun, with the following results:
2	25	25	1	The gun was then put under the water spray with the following results:
3	25	21	3	Link belt used. The gun was cleaned and heavily oiled. The gas port was set wide open. In 25 round preliminary firing, consistent failures to eject or weak ejection were obtained. The gun was stripped and thoroughly coated with "lubriplate". 65 rounds were fired satisfactorily The gun was put under the water spray with the following results:
4	50	33	6	The gun was then thoroughly cleaned and oiled. Consistent weak ejection and failures to eject were obtained.

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(5) Browning Automatic Rifle.

rial o.	Rds. tried under spray	Number of mal-functions	First mal-function at round number	Remarks
			(a) Gun #33712	
1	30	13	8	Gun initially set on small gas port. After this firing, set on large port and firing resumed with results as follows:
2	60	19	30	Malfunctions were failures to fire.
3	150	27	20	Malfunctions mostly failures to fire. Gun set on small port. After completion of this firing, gun lubriplated as thoroughly as possible without disassembly and firing resumed, with results as follows:
4	200	3	70	
			(b) Gun #81690	
1	60	21	25	Mostly failures to fire, with some failure to eject. Gun set on large port initially. After above firing, gun "lubriplated" as thoroughly as possible without disassembly and firing resumed, with results as follows:
2	200	8	10	Mostly failures to fire.
			(c) Gun #111744	
1	80	22	35	After completion of this firing, gun was "lubriplated" as well as possible without disassembly and firing resumed, with results as follows:
2	200	10	8	Malfunctions mostly failure to eject.

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(6) Light Machine Gun M1919A6.

All firing with muzzle plug on gun.

(a) Gun #707837

rial o.	Rds. tried under spray	Number of mal-functions	First mal-function at round number	Remarks
1	530	None	None	
2	241	None	None	
3	400	1	310	Bolt failed to lock properly 1 time
			(b) Gun #707838	
1	175	22	126	Bolt failed to lock properly.
2	225	13	10	Failures to feed and lock properly.
				Gun doped with "lubriplate" as well as possible without disassembly and the following rounds fired:
3	225	None	None	
			(c) Gun #707839	
1	366	10	201	Failures to lock.
2	450	1	35	Failure to feed.

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Test No. 16

a. Purpose: To study malfunctions obtained with the guns used in this test.

b. Method: A record was kept of rounds fired, malfunctions and changes made to the guns.

c. Results:

(1) In general, all stoppages are listed. However, not all malfunctions are listed each time they occurred. For example, T23 #1 throughout the test had a very erratic rate when firing on slow rate. This was listed occasionally in the log.

(2) (a) Ammunition lot [illegible] 20188, grade MC, originally came belted 1-4 tracer. The tracer rounds were removed and ball cartridges inserted by hand. A considerable number of rounds in each belt were slightly damaged. Where a stoppage was evidently due to a faulty round, it was not usually listed.

(b) Ammunition lots RA 33019 and RA 33032, grade AC or R, were originally packed 8 rounds per clip. Belts were carefully loaded by test personnel.

(3) Throughout the test, stoppages were studied by the test officer, Capt. Howell and Capt. Sturtevant. An effort was made to determine the cause of the stoppage and to eliminate the conditions causing the stoppage, in so far as possible. Thus in the early part of the test it was thought that thick rims were causing failure of the bolt to close on the T23 guns. Belts were examined and a number of rounds with thick rims tried for functioning. Where a stoppage keeps occurring over a considerable period of time in the following log, it indicates that the test officer and the Ordnance representatives were unable to diagnose the cause and/or effect a cure.

(4) (a) The safety stop plunger is designed to block the slide in case the trigger is pulled when the barrel locking handle is raised. The plunger generally did not perform its mission on these guns. On several occasions when the trigger was pulled with the locking handle up the safety plunger was driven out of the gun and fell on the ground.

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(b) The trigger mechanism and/or rate reducer did not work satisfactorily on Nos. 1 and 5 guns. Slow rate on No. 1 was very erratic. On No. 5 the gun would occasionally stop during firing when set on slow rate.

1. Log of Malfunctions and Changes

T23E2 No. 1 (long stock)

17 July 1944
Ammunition lot: DM 20188, Grade MC

Round No. to date	Malfunction	Remarks
		No. 1 Barrel installed.
48	Fail to extract. Rim torn off case.	
70	Fail to extract.	
75	Fail to extract.	Another extractor installed.
77	Fail to extract. Several minutes after completion of above, barrel could not be removed. Finally pounded loose.	Old extractor replaced. No. 4 barrel installed. Gas port opened to help extraction.
173		Gun cleaned and oiled. Barrel relieved to help removal.

18 July 1944
Ammunition lot: DM 20188, Grade MC

213	Bolt closed on empty chamber.	
223	Bolt closed on empty chamber.	
228	Bolt closed on empty chamber.	
243	Bolt would not go forward.	Shell pried out of bolt.
263	Bolt closed on empty chamber.	
273	Cartridge blew up in feedway. Primer shows signs of being hit by extractor cam edge. Barrel had to be pounded out. Barrel handle knocked loose while pounding out.	
274	Bolt would not go forward.	Case pried out of bolt.
423		No trouble.

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18 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
433	Bolt closed on empty chamber.	
453	Bolt closed on empty chamber.	
493	Bolt fell out of feedway.	
503	Bolt fell out of feedway.	
524	Bolt fell out of feedway.	
525	Bolt fell out of feedway.	
		Next 50 rounds in belt evenly spaced by hand.
548	Bolt fell out of feedway.	
553	Bolt closed on empty chamber.	
593	Bolt closed on empty chamber.	
618		Gun cleaned and oiled.

19 July 1944
Ammunition lot: [illegible] 20188, Grade MG

		Opened up gas sleeve on barrel. Burred slide.
668	Bolt closed on empty chamber.	
688	Bolt closed on empty chamber.	
708	Bolt closed on empty chamber.	Bolt laid on ground
718	Bolt fell out of feedway.	
828	Bolt closed on empty chamber.	
868		No trouble.
933	Bolt closed on empty chamber.	
988	Bolt closed on empty chamber.	
1028	Bolt closed on empty chamber.	
1048	Bolt closed on empty chamber.	
1050	Bolt closed on empty chamber.	
1108	Bolt not pulled into feedway by bolt feed slide.	
1118		No trouble.
1143	Bolt would not go home.	Shell pried out of bolt.
1193	Bolt would not close.	Shell pried out of bolt.
		New cartridge extractor push lever spring installed.

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19 July 1944 (Cont'd.)

Round No. to date	Malfunctions	Remarks
1196	Bolt closed on empty chamber.	
1218	Bolt closed on empty chamber.	
1221	Bolt closed on empty chamber.	
1250		Removed old belt. Installed belt which had not been unpacked. Same lot: DM 20188.
1260	Windage scale fell off sight.	
1265	Bullet came out of case and fell in action.	
1266	Bolt would not close.	Case pried out of bolt.
1276	Bolt would not close.	Case pried out of bolt.
1300	Bolt closed on empty chamber.	
1380	Ruptured cartridge; headspace burst apparently.	
1500		No trouble.
		No. 5 Barrel installed.
1505	6 o'clock stub.	
1530	6 o'clock stub.	
1550	Bolt closed on empty chamber.	
1565	6 o'clock stub.	
1600	6 o'clock stub.	
1636		No trouble.
1641	6 o'clock stub.	
1663	Bolt would not go home.	Shell pried out of bolt. Gun cleaned and oiled.

20 July 1944
Ammunition lot: DM 20188, Grade MC

		No. 1 barrel headspaced; about 1.947 Installed No. 6 barrel. Headspaced 1.946
1713	Bolt closed on empty chamber.	
1749	Bolt closed on empty chamber.	
1803	Mouth of case sheared by edge of chamber.	

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20 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
1838	Bolt closed on empty chamber.	
1883	Bolt would not go closed.	Shell pried out of bolt.
1913		No trouble.
1935	Bolt closed on empty chamber.	
1943	Bolt closed on empty chamber.	
1968	Bolt closed on empty chamber.	
1970	Bolt closed on empty chamber.	
1998	Bolt closed on empty chamber.	
2043	Bolt closed on empty chamber.	
2045	Bolt closed on empty chamber.	
2068	Bolt would not go closed.	Shell pried out of bolt. Edges of "T" Slot stoned slightly.
2083	Bolt would not release.	Shell pried out of bolt.
2088	Bolt would not release.	
2089	Bolt would not release.	
2163		No trouble.
2186		No trouble.

Lot #RA 33019 Installed, Grade AC or R.
New belts loaded by test personnel.

2326	Bolt closed on empty chamber.	
2356		No trouble.

21 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

Barrel #6

2546	Broken Firing Pin.	New firing pin installed. Square shoulders on firing pin had to be ground to fit rounded slot in bolt.
2606		No trouble.
2686	6 O'clock stub.	
2766	6 o'clock stub.	
2771	6 o'clock stub.	
2781	6 o'clock stub.	

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21 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
2783	7 o'clock stub.	
2831	6 o'clock stub.	
2856		No trouble.
2860	Bolt closed on empty chamber.	
2866	Bolt closed on empty chamber.	
2876	Bolt closed on empty chamber.	
2953	Bolt closed on empty chamber.	
2956	Bolt closed on empty chamber.	
		Remaining rounds in belt pushed well into belt.
3076	Bolt closed on empty chamber.	
3090	6 o'clock stub.	
3106		No trouble.

Ammunition lot: DM 20188, grade MC

Barrel carrying handle had to be pounded hard to get it over out of carrying position.

3116	Bolt would not release.	Round pried out of bolt.
3123	Bolt would not release.	Round pried out of bolt.
3161	Bolt closed on empty chamber.	
3181	Bolt would not release.	Round pried out of bolt.
3208	Bolt would not release.	Round pried out of bolt.
3301	6 o'clock stub.	
3341	6 o'clock stub.	
3345	6 o'clock stub.	
3359	6 o'clock stub.	
3364	6 o'clock stub.	
3369	6 o'clock stub.	
3389	6 o'clock stub.	
3391	6 o'clock stub.	
3438	6 o'clock stub.	
3552	6 o'clock stub.	
3611	Bolt would not release.	Round pried out of bolt.
3641	Barrel frozen.	Gun cleaned and oiled.

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22 July 1944
Ammunition lot: R.A. 33019, Grade MC

Round No. to date	Malfunction	Remarks
		Barrel #6
3754	12 o'clock stub. Had difficulty getting bolt to rear.	
3755	Same round put back in belt and two rounds fed into T slot. Ejector broken.	Spare ejectors different from ejector in this gun. This gun has slotted ejector recess. Spare ejectors of other guns are square.
		Bolt assembly from No. 5 gun installed in gun #1.
3754	Failed to eject.	
3760	Failed to eject.	
3761	Failed to eject.	
3762	Failed to eject.	
3763	Failed to eject.	
3764	Failed to eject.	
		No. 5 bolt removed and No. 4 bolt installed.
3765 to 3776	Failed to eject.	
		No. 1 bolt replaced and gun out of action. Gun cleaned and oiled.

26-29 July 1944

Capt. Sturtevant, O.D., Springfield Armory, arrived with spare parts and made the following changes:

Modified case extractor to hold round in alignment when feeding into chamber.

Modified one ejector to fit bolt in this gun, which is slightly different than the other three.

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26-29 July 1944 (Cont'd.)

Round No. / Range date	Malfunction	Remarks
		Cleaned carbon from gas plug valve threads.
		Added slight chamfer to barrel chamber.
		Modified gas plug valve screw to permit throttling of gas port.
		Headspaced gun to approximately 1.946.
		Marked No. 1 barrel as having chamber out of dimension. Headspace high.
		Completely disassembled weapon and checked, burred, and adjusted wherever necessary.
3976	200 rounds fired to check gun by Capt. Sturtevant.	

31 July 1944
Ammunition lot: D.M. 20188, Grade MC

No. 1 Barrel. Gas port open 1/3 turn.

3983	Bolt closed on empty chamber.	
3984	Failed to eject.	Gas port opened to 1/2 turn.
3985	Bolt closed on empty chamber.	
3996	Bolt closed on empty chamber.	The next 25 rounds were pushed farther into belt.
4014	Bolt closed on empty chamber.	
4015	Belt fell out. Bolt closed on empty chamber.	
4025	Bolt closed on empty chamber.	
4026	Bolt closed on empty chamber.	
4036	Bolt closed on empty chamber.	
4037	Belt fell out. Bolt closed on empty chamber.	

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1 July 1944 (Cont'd.)

ound No. o date	Malfunction	Remarks
4042	Failed to eject.	
4043	Belt fell out. Bolt closed on empty chamber.	
4051	Failed to eject.	Gas port opened to 3/4 turn.
4054	Belt fell out. Bolt closed on empty chamber.	
4059	Belt fell out. Bolt closed on empty chamber.	
4062	Bolt closed on empty chamber.	The next 100 rounds pushed up into belt.
4077	Bolt closed on empty chamber.	
4151	Bolt closed on empty chamber.	
4152	Bolt closed on empty chamber.	
4176		200 round belt finished O.K. Tried balance of 50 rounds in A-4 M.G. Would not fire at all. Tried in another A-4 M.G. and fired without a stoppage. This was belt that had failed in T-23 No. 1, from RD 3976-4176.
	Ammunition lot: RA 33019, Grade AC or R	
4239	Bolt closed on empty chamber. Cadence erratic on slow rate.	
4281	Bolt closed on empty chamber.	
4361		Gas port closed to 1/4 turn.
4426		Gun fired more evenly on slow rate with port closed. Barrel removed easily.
4436	Ruptured cartridge.	
4676		Barrel removed and cooled. Barrel to be left on gun for following firing:
4726	6 o'clock stub on chamber. Slow cyclic rate erratic.	
4926		Gun cooled without removing barrel.
5151	Failed to eject.	Barrel cooled and easily removed.
5176		Gun cleaned and oiled.

Authority NND 735022

1 August 1944
Ammunition lot: R.A. 33032, Grade AC or R

ound No. date	Malfunction	Remarks
		Firing from T-66 triped. Barrel No. 3. No. 3 trigger mechanism. Trigger group from No. 3 gun had to be used in No. 1 to fit triped.
4986	Failure to eject.	Changed to Barrel No. 1.
4988	Ruptured cartridge.	Tightened headspace.
4996	Ruptured cartridge.	Changed to No. 6 Barrel.
5023	Ruptured cartridge.	No. 1 Barrel has deep chamber.
5046	Barrel stuck; gas plug loose.	Plug tightened.
5047	Failure to eject.	
5049	Failure to eject.	
5051	Failure to eject.	Gas port set to 1/2 turn open.
5052	Failure to eject.	
5053	Failure to eject.	Gas port set to 3/4 turn open.
5054	Failure to eject.	Receiver oiled. Gas cylinder oiled.
5104	Failure to eject. Firing single shot when set on slow rate.	Gas port opened to 1 turn.
5226		No trouble.
		No. 1 Barrel installed.
5234	6 o'clock stub.	
5236	Ruptured cartridge.	No. 1 Barrel replaced with No. 6.
5242	6 o'clock stub.	Gas port set to 1/2 turn open.
5286		Gas port set to 3/4 turn open.
5287	Failure to eject.	Gas port set to 1-1/4 turn open.
5289	Failure to eject.	
5399	Bolt fell out. Bolt closed on empty chamber.	
5476		No trouble.
5488	Bolt fell out. Bolt closed on empty chamber.	
5641	6 o'clock stub.	
5676	Fail to extract round from belt because belt feed pawl arm in between two rounds. Bolt could not go home because feeding mechanism jammed.	

Authority NND 735022

1 August 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
5726		No trouble. (No. 3 trigger mechanism in this gun.)
5726-7	Double shots.	
5736	Bolt closed on empty chamber. Gun runs away on single shot. Trigger mechanism probably the cause.	
5822	Failure to eject.	Gun cleaned and oiled.
5976		

2 August 1944
Ammunition lot: R.A. 33032, Grade AC or R

No. 3 trigger mechanism. No. 6 Barrel.

Firing from T-88 Mount.

6112	Double shots with No. 3 trigger mechanism. Failure to eject.	
6226		No trouble.
6233	Failed to feed. Bolt closed on empty chamber. Caused by belt not feeding properly. Round hung in feedway.	
6234	Failed to feed. Bolt closed on empty chamber. Caused by belt not feeding properly. Round hung in feedway.	
6244	Failed to feed. Bolt closed on empty chamber. Caused by belt not feeding properly. Bolt jammed half way with live round, caused by cartridge lodged diagonally in feedway.	
6245	Failed to feed.	Bolt feed pawl changed. Original pawl somewhat worn and loose in its slide. Filed upper pawl - increased tension on spring.
6254	Failure to eject.	
6280	Failed to feed. Bolt closed on empty chamber.	

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Round No. to date	Malfunction	Remarks
6286	Failure to eject.	
	Continued erratic fire on single shot with No. 1 trigger mechanism.	
6426	Failure to feed - Bolt closed on empty chamber.	
6476		No trouble.
6551	Failure to eject.	
6621	Failure to fire.	
6666	Bolt fell out, bolt closed on empty chamber.	
6676	Failure to feed - Bolt closed on empty chamber.	
6681	Failure to eject.	
6683	Failure to eject.	
6685	Failure to eject.	
6688	Fail to feed - Bolt closed on empty chamber. No cartridge seated in feedway. Pulled bolt back but did not feed.	
6726		No trouble.

3 August 1944
Ammunition lot: R.A. 33032, Grade AC or R

		No. 6 Barrel. Gas port opened 1/4 turn.
6836	Failure to eject.	
6976		No trouble. Barrel removed easily.
7156	Erratic slow fire.	
7176	6 o'clock stub.	
7226		No trouble.
7356	6 o'clock stub.	
7381	Bolt slipped out. Bolt closed on empty chamber. Bolt jammed forward.	
7413		Gun stripped for examination.
		Operating slide cracked. Gun taken out of action.
7413		Gun cleaned and oiled.
		Slide brazed.
7613		Fired O.K. with brazed slide.

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4 August 1944
Ammunition lot: R.A. 33032, Grade AC or B

ound No. date	Malfunction	Remarks
7614	Failure to eject.	
7615	Failure to eject.	
7626	Failure to eject.	
7628	Failure to eject.	Gun examined. Gas port closed.
7629	Failure to eject.	Open gas port 1 turn.
7630	Failure to eject.	Open gas port 2 turns.
7631	Failure to eject.	Open gas port 3 turns.
7632	Failure to eject.	Open gas port 4 turns.
	Metallic Link Belt installed. Ammunition Lot R.A. 33019, Grade AC or B	
7631	Failure to eject.	Port closed.
7632	Failure to eject.	Port opened 1 turn.
7637	Failure to eject.	Port open 2 turns.
7642	Failure to eject.	
7644	Failure to eject.	
7645	Bolt closed on empty chamber.	
7670	Failure to eject.	Port opened 2-1/2 turns.
7672	Failure to eject.	
7673	Failure to eject.	
7702	Failure to eject.	
7706	Failure to eject.	
7707	Bolt closed on empty chamber.	
7708	Bolt closed on empty chamber.	
7709	Failure to eject.	
7735	Failure to eject.	
7736	Failure to eject.	
	Burr on bolt link and receiver apparently cause of ejection trouble.	Burrs removed from bolt link and receiver.
8136	Test fired 400 rounds. No record.	Gun cleaned and oiled.

Note: During the period 4-8 August, this gun was tried for functioning under a water spray. All rounds are listed in this log, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

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4 August 1944
Ammunition lot FA 3817, experimental

ound No. o date	Malfunction	Remarks
8186		No trouble to here.
8236		Water test to here. Gun cleaned and oiled.

7 August 1944
Ammunition lot FA 3817, experimental

	3 failures to eject.	
8251	Consistent weak ejection.	Fabric belt to here.
8286	Consistent failures to fire, and failures to eject.	Link belt to here.
8311		Water test to here. Gun cleaned and oiled.
	4 failures to eject.	
8361	1 bolt closed on empty chamber.	Gun cleaned and oiled.
	Consistent failures to eject, due to short recoil. Parts changed, gun examined carefully, but short recoil persisted.	
8400		Gun cleaned and oiled. Test discontinued.

Total rounds fired in this test: 8400

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2. Log of Malfunctions and Changes

T23E2 No. 3

17 July 1944
Ammunition lot: DM 20188, Grade MG

Round No. to date	Malfunction	Remarks
		Barrel No. 3
40	Fail to extract. Rim torn off cartridge.	
75	Fail to extract. Rim torn off cartridge.	
75		Belt from No. 5 gun put on this gun. This belt gave 132 rounds without a stoppage on No. 5 gun.
80	Fail to extract. Rim torn off cartridge.	
		Gas port opened.
152		No trouble.
219		Gun cleaned and oiled.

18 July 1944
Ammunition lot: DM 20188, Grade MG

		Barrel No. 3
319	Stub at 5 o'clock.	
394	Stub at 6 o'clock.	
399	Stub at 6 o'clock.	
469		Gun cleaned and oiled.

19 July 1944
Ammunition lot: DM 20188, Grade MG

		Barrel No. 3
549	Bolt closed on empty chamber.	
559	Bolt would not release.	Pried shell out of bolt.
569	Case jammed against side of the chamber. Bullet cane out and dumped powder in action.	Stripped and powder cleaned out. Gas port opened.

Authority NND 735022

July 1944 (Cont'd.)

und No. date	Malfunction	Remarks
579	Case jammed against side of chamber. Bullet came out.	Powder cleaned out of action.
719		No trouble.
849	Bolt would not go forward. Shell pried out; bolt still would not go forward. Found that connector not catching under forward edge of sear.	Bent sear spring down to increase pressure on connector.
969		No trouble.
1084	Case mouth damaged by sharp edge of chamber.	Barrel removed and cooled. Chamber mouth chamfered slightly.
1109	5 o'clock stub on edge of chamber.	
1219		No trouble.
1319	5 o'clock stub on edge of chamber.	
1469		Gun cleaned and oiled.

20 July 1944
Ammunition lot: RA 20188, Grade MG

Barrel No. 3 headspaced: Took 1.946 satisfactorily. No. 6 barrel installed and headspaced: Took 1.946 tightly.

1519	6 o'clock stub on edge of chamber.	
1539	Bolt closed on empty chamber.	
1719		No trouble.
1779	6 o'clock stub on edge of chamber.	
1799	6 o'clock stub on edge of chamber.	
1894	6 o'clock stub on edge of chamber.	
1969	On last 30 rounds, occasional runaways on slow rate. Would run 3-4 rounds.	

Lot RA 33019 installed. Packed in 8 round clips. Loaded in new belts by test personnel.

1970	First round: Barrel blown off gun and case ruptured. Found tooth on barrel locking collar had sheared, so pushing handle down did not rotate locking collar.	New tooth installed. Headspace checked. New gas piston head retaining pin installed.

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0 July 1944 (Cont'd.)

ound No. o date	Malfunction	Remarks
2019	6 o'clock stub.	
2049	6 o'clock stub.	
2054	5 o'clock stub.	
2149	6 o'clock stub.	
2151	6 o'clock stub.	
2153	6 o'clock stub.	
2194	6 o'clock stub.	
2214	6 o'clock stub.	
2219		Rifle cleaned and oiled.

21 July 1944
Ammunition lot: RA 33019, Grade AC or B

No. 3 Barrel.

2244	6 o'clock stub.	
2269	6 o'clock stub.	
2289	6 o'clock stub.	Different shell extractor installed. Different case extractor installed.
2327	6 o'clock stub.	
2335	6 o'clock stub.	
2353	6 o'clock stub. Hinge pin on cover plate worked partially out.	Pin pounded back.
2387	6 o'clock stub.	
2391	6 o'clock stub.	
2402	6 o'clock stub.	Different shell extractor installed.
2404	5 o'clock stub.	
2469	6 o'clock stub.	
2586	3 o'clock stub.	
2630	6 o'clock stub.	
2656		Gas plug installed with port in line with barrel port.
2677		Gas plug changed back to original position.
2697	6 o'clock stub.	
2719		No trouble.

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21 July 1944 (Cont'd.)

Ammunition lot: IM 20188, Grade MC

Round No. to date	Malfunction	Remarks
2739	6 o'clock stub.	
2938	Piston retaining pin head broken. Barrel frozen. Piston head retaining pin sheared off. Bolt would not close enough to fire shell. While installing new rivet, broke piston head.	Piston from No. 5 gun installed. New piston retaining pin installed.
2969		No trouble.

Ammunition lot: RA 33019, Grade AC or R

2984	5 o'clock stub.	
3061	11 o'clock stub.	Gun cleaned and oiled.

22 July 1944

Ammunition lot: RA 33019, Grade AC or R

Barrel No. 6

3083	6 o'clock stub.	
3098	12 o'clock stub.	
3102	Round fed under barrel.	
3104	12 o'clock stub.	
3150	12 o'clock stub.	
3201	12 o'clock stub.	
3251	6 o'clock stub.	
3261	5 o'clock stub.	
3311		No trouble.
3316	6 o'clock stub.	
3321	Bullet stubbed, case ripped and prevented shell from entering chamber. Apparent cause improper feeding.	
3323	Next round would not go into chamber. Bolt could not go home. Caused by belt feed pawl finger holding belt.	
3326	6 o'clock stub.	
3339	6 o'clock stub.	
3363	Bolt failed to fully close (twisted belt).	
3381	Belt fell out of feedway.	

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22 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
3386	Bolt failed to close. Gun stripped down and piston head retaining pin found broken. Shattered parts of pin found in gun. Gun apparently firing some time with pin broken. Piston head extended somewhat from piston body and was frozen. Parts of pin found in head.	Shell pried out of bolt. Piston head cooled and removed. Installed new piston head retaining pin.
3421	6 o'clock stub.	
3486	11 o'clock stub.	
3491	Failure to extract. Rim torn off cartridge.	
3561		No trouble.
3576	5 o'clock stub.	
3633	Failure to eject. Round caught in ejection port.	
3634	12 o'clock stub.	
3638		Gun cleaned and oiled.

24 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

3638		Barrel No. 6
3648		No trouble.
3898	6 o'clock stub.	
4044	Failure to eject. Gun had to be taken apart to clear stoppage. Piston head retaining pin broken. Broken part had bolt and slide jammed.	New piston head retaining pin installed.
4046	Bolt closed on live round. (Failed to fire).	
4138		No trouble.
4288	11 o'clock stub.	
4303	11 o'clock stub.	
4318	11 o'clock stub.	
4328		No trouble.

Magazine installed. Barrel could not be locked.

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24 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
		Barrel No. 3
		Barrel locking handle filed down so barrel could be locked.
4428	Bolt closed on live round. Failure to fire.	
4446	Bolt closed on live round. Failure to fire.	
4528	Broken firing pin.	Firing pin replaced.
4628		No trouble.
		Barrel No. 6 placed in gun.
4720	Ruptured cartridge.	
4728		No trouble.
4828		No trouble.
4861	6 o'clock stub.	
4868	6 o'clock stub.	
4928	Piston head retaining pin sheared off.	New piston head retaining pin installed. Gun cleaned and oiled.

25 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

		Barrel No. 6
4938	Ruptured cartridge.	
4940	Ruptured cartridge. Barrel locking collar key slid partially out. Lock screw still tight.	Replaced barrel No. 6 with No. 8. Gun taken to Ordnance to be headspaced.
		Locking key reassembled and staked.
5028		No trouble.
5072	11 o'clock stub.	
5083	6 o'clock stub.	
5113	6 o'clock stub.	
5128		No trouble.
5138	Bolt failed to release.	Shell pried out of bolt.

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25 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
5163	6 o'clock stub.	
5168	12 o'clock stub.	
5185	6 o'clock stub.	
5193	12 o'clock stub.	
5228		No trouble.
5263	6 o'clock stub.	
5298	Stubbed into chamber - case torn.	
5300	Bolt would not close because round in belt was behind bullet stop.	
5325	11 o'clock stub.	
5328	Barrel locking collar key slid partially out. Lock screw tight.	Key reassembled and staked in place.
5366	12 o'clock stub.	
5389	12 o'clock stub.	
5426	5 o'clock stub.	
5428		No trouble.
5449	12 o'clock stub.	
5488	12 o'clock stub.	
5520	12 o'clock stub.	
5528	12 o'clock stub.	
		Magazine removed.
5546	12 o'clock stub.	
5558	Ruptured cartridge, part of case jammed in gun, jamming whole receiver. Gun taken out of action. Piston head retaining pin shattered.	
5558		Gun cleaned and oiled.

26 - 29 July 1944

Capt. Sturtevant, O.D., Springfield Armory, arrived with spare parts and made the following changes:

Removed burrs from:

(1) Rear of gas piston.

Authority NND 735022

ound No. / e date	Malfunction	Remarks
		(2) Feedway section of receiver. (3) Back plate.
		Removed brass chips from firing pin recess of bolt.
		Replaced case extractor having worn lower lip with new extractor. Replaced piston head retaining pin with heat treated pins. (Inserted under pressure in vise.)
		Replaced barrel lock spring which was slightly worn. (Not essential.) Lubricated barrel carrying handle plunger. Cleaned carbon from gas plug valve threads and from valve to permit throttling of gas to slow gun.
		Added slight chamfer to barrel chamber.
		Modified gas plug valve screw by increasing stud length. Head-spaced gun to approximately 1.946. Completely disassembled weapon, including receiver group, and checked, burred and adjusted wherever necessary.
	29 July 1944	
3708	Test firing by Capt. Sturtevant	

Authority NND 735022

31 July 1944
Ammunition lot: DM 20188, Grade MC

Round No. to date	Malfunction	Remarks
5708		Gas port closed. No. 3 Barrel.
5723	Failure to eject.	Gas port opened 1/4 turn.
5831	Spring came off ejection port cover.	Spring reassembled.
5833		No trouble.

Ammunition lot: R.A. 33019, Grade AC or R

5958		Barrel came off easily.
6.08		No trouble. Barrel cooled. Barrel came off easily.
6458		Barrel to be left on gun for following firing.
		Gun cooled.
6708		No trouble. Gun cooled.
6768	3 o'clock stub.	
6833		Barrel not cooled but easily removed after firing last 625 rounds.
		Gun cleaned and oiled.

1 August 1944
Ammunition lot: R.A. 33032, Grade AC or R

		No. 3 Barrel. Gas port 1/4 turn open.
6853	Barrel handle came loose.	
7037		No trouble.
		Gas port opened 4 turns.
7063	6 o'clock stub.	
7137		Gun cleaned and oiled.

3 August 1944
Ammunition lot: R.A. 33032, Grade AC or R

No. 3 Barrel.

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August 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
7387		No trouble. Barrel removed easily.
7637		No trouble.
7887		No trouble.
8137		No trouble. Barrel easily removed.
8387		No trouble. Barrel easily removed.
8537		Gun cleaned and oiled.
8657		No trouble.
8707		Gun cleaned and oiled.
	4 August 1944 Ammunition Lot: R.A. 33032, Grade MC	
		No. 3 Barrel.
8817	Failure to eject - gas cylinder plug loose.	Plug tightened.
8957		No trouble.
	F.A. AMMO 3817, Experimental Lot	
9207		No trouble.
9357		No trouble. Gun cleaned and oiled.

Note: During the period 4-8 August, this gun was tried for functioning under a water spray. All rounds are listed in this leg, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

	4 August 1944 Ammunition Lot: FA 3817, experimental	
9507		No trouble to here.
9574		Water test to here. Rifle cleaned and oiled.
9649		No trouble to here. 50 rounds fabric belt and 25 rounds link belt used.

Authority NND 735022

4 August 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
9699		Water test to here. Rifle cleaned and oiled.
9774		No trouble to here.
0374		Water test to here. Rifle cleaned and oiled.
	8 August 1944 Ammunition lot: FA 3817	
0499	1 ruptured cartridge to here.	
0715		Water test to here.

Total rounds fired in this test 10715

Authority NND 735022

2. Log of Malfunctions and Changes

T23E2 No. 4

17 July 1944
Ammunition lot: DM 20188, Grade MG

Round No. to date	Malfunction	Remarks
66		Rifle cleaned and oiled.
	18 July 1944 Ammunition lot: DM 20188, Grade MG	
146	Bolt would not go forward.	Shell pried out of bolt.
166	Bolt would not go forward.	Shell pried out of bolt.
181	5 o'clock stub on chamber.	
216	Misfire: light blow. Fired on 2nd try. Belt possibly caught on edge of ammunition box.	
316		Rifle cleaned and oiled.
	19 July 1944 Ammunition lot: DM 20188, Grade MG	
566		No trouble.
668	Bolt would not go forward.	Shell pried out of bolt.
672	Failure to eject. Found ejector bumper broken. No spare. Gun out of action temporarily.	
	26-29 July 1944	
		Capt. Sturtevant, O.D., Springfield Armory, arrived with spare parts and made the following changes: Installed new ejector bumper. Removed burrs from: Rear of gas piston. Feedway section of receiver. Back plate.

Authority NND 735022

26-29 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
		Replaced piston head retaining pin with heat treated pin.
		Removed carbon from gas plug valve threads.
		Modified gas plug valve screw.
		Added slight chamfer to chamber at breech.
		Headspaced gun to approximately 1.946.
		Completely disassembled weapon, including receiver, and checked, burred and adjusted where necessary.
		Modified case extractor to retain and align round more accurately while feeding into chamber
872		200 rounds fired for check.
		Rifle cleaned and oiled.

31 July 1944

Ammunition lot: IM 20188, Grade MC

		No. 8 barrel installed.
		Gas port closed.
873	Failed to eject.	Gas port opened to 1/2 turn.
882	Failed to eject.	Gas port opened to 3/4 turn.
889	Failed to eject.	Gas port opened to 1 turn.
997	Barrel difficult to remove.	

Ammunition lot: RA 33019, Grade AC or R

1187	6 o'clock stub on chamber.	
1216	6 o'clock stub on chamber.	Ramp filed on rear edge of chamber.
		Gas cylinder sleeve opened up.
1247		No trouble.
1324	6 o'clock stub on chamber.	
1490	6 o'clock stub on chamber.	
1497	Barrel difficult to remove.	

Authority NND 735022

31 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
1505	6 o'clock stub on chamber.	
1717	Action stopped: stripped, found a number of brass particles in action. Cleaned out.	
1725	6 o'clock stub on edge of chamber.	Gas port set 3/4 turn open.
1747		Rifle cleaned and oiled.
	1 August 1944	
	Ammunition lot: RA 33032, Grade AC or R	
1748	Failure to eject	Gas port 1/2 turn open.
1750-1757	Trigger operating improperly.	Another trigger group installed.
1760	Failure to eject.	
1763	Failure to eject.	
1764	Failure to eject.	
1767	Failure to eject.	Gas port opened to 3/4 turn.
1997		Rifle cleaned and oiled.
	2 August 1944	
	Ammunition lot: RA 33032, Grade AC or R	
	Firing from M2 tripod	
	Trigger very hard to pull.	Replaced connector.
	Still difficult to pull.	Installed trigger group from No. 5 gun.
		Worked satisfactorily.
		Installed trigger group from No. 4 gun.
		Worked satisfactorily.
2197	Cartridge in bolt fed under barrel.	
2247		No trouble.
2326	Cartridge in bolt fed under barrel.	
2402	Cartridge in bolt fed under barrel.	
2472	Gun stopped firing during a burst.	Pulled trigger again and fired satisfactorily.
2497		Gun cleaned and oiled.

Authority NND 735022

3 August 1944
Ammunition lot: RA 33032, Grade AC or R

Round No. to date	Malfunction	Remarks
		No. 4 barrel installed.
2500	6 o'clock stub on chamber.	
2501	6 o'clock stub on chamber.	
2747	Barrel slightly difficult to remove.	
2752	Bolt would not go forward.	Shell pried out of bolt.
2841	6 o'clock stub on chamber.	
2842	6 o'clock stub on chamber.	
2844	Cartridge in bolt fed under barrel	Gun stripped for examination and oiled.
2909	6 o'clock stub on chamber.	
2997		No trouble.
3242	6 o'clock stub on chamber.	
3247		No trouble.
3377	6 O'clock stub on chamber.	
3387	Cartridge fed under barrel.	
3405	6 o'clock stub on chamber.	
3487	6 o'clock stub on chamber.	
3497		Gun cleaned and oiled.

4 August 1944
Ammunition lot: RA 33032, Grade AC or R

		No. 4 barrel.
3617	5 o'clock stub.	
3747		No trouble.
3847	6 o'clock stub.	
3947	6 o'clock stub.	
3997		No trouble.
4072	6 o'clock stub.	
4122	6 o'clock stub.	
4129	6 o'clock stub.	
4247		No trouble.
4357	6 o'clock stub.	
4395	6 o'clock stub.	
4397	6 o'clock stub.	
4497		No trouble.
4747		No trouble. Gun cleaned and oiled.

Authority NND 735022

Note: During the period 4-8 August, this gun was tried for functioning under a water spray. All rounds are listed in this log, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

4 August 1944
Ammunition lot: FA 3817, experimental

Round No. to date	Malfunction	Remarks
4797		No trouble to here.
	3 Failures to eject.	
4839	1 Bolt closed on empty chamber.	Link belt to here.
4867		Water test to here.
	1 Failure to feed.	
	1 Failure to eject.	
4947	2 Failures to fire.	Metallic link belt to here.

7 August 1944
Ammunition lot: FA 3817, experimental

	4 Failures to eject.	Gun stripped and thoroughly examined.
4978	Consistent weak ejection.	Gun thoroughly cleaned and oiled.
	1 Failure to eject.	
5053	Still weak ejection.	Both fabric and link belts used to here.
5079		Water test to here.
		Gun dried and oiled thoroughly.
5104		No trouble.
5154		Water test to here.

8 August 1944
Ammunition lot: FA 3817, experimental

5354		No trouble to here.
5414		Water test to here.

Total rounds fired from this gun in this test: 5414

Authority NND 735022

4. Log of Malfunctions and Changes

T23E2 No. 5 (long stock)

17 July 1944
Ammunition lot: DM 20188, Grade MI

Round No. / date	Malfunction	Remarks
173	Approximately 30' after completion, could not remove barrel	Rifle cleaned and oiled

18 July 1944
Ammunition lot: DM 20188, Grade MI

273	Capt. Howell firing for function.	
548	Bolt would not go forward	Shell pried out of belt. Gun stripped and oiled.
573	Bolt would not go forward	Shell pried out of belt. Barrel safety plunger removed. Spring weak and not holding.
623		No trouble.
673		No trouble
881	Mouth of case damaged by edge of chamber. Bullet fell into action.	Gun cleaned and assembled.
1078		Rifle cleaned and oiled.

19 July 1944
Ammunition lot: DM 20188, Grade MI

1158	Bolt would not go forward.	Worked loose by hand.
1159	Bolt would not go forward.	Worked loose by hand.
1160	Bolt would not go forward.	Worked loose by hand.
1161	Bolt would not go forward	Worked loose by hand
1168	Bolt went home on empty chamber and belt fell out. Perhaps hung on edge of box.	Belt put on ground.
1273	Belt fell out of feedway.	
1283		Gas port opened up.
1328		No trouble.
1508	Belt fell out of feedway. Round long in belt.	
1553	Bolt would not go forward	Shell pried out of belt.
1578		No trouble. BAR gear installed. New cartridge extractor push lever

Authority NND 735022

19 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
		spring installed. #4 barrel installed.
1593	Bolt would not release.	Shell pried out of belt.
1803	Bolt closed on empty chamber.	
1828		No trouble.
1964		Rifle cleaned and oiled.

20 July 1944
Ammunition lot: BM 20188, Grade MO

		Headspace #5 barrel checked. Took 1.946 gage satisfactory. Installed and headspaced #9 barrel. Tight on 1.946 gage.
2015	Failure to eject. Round in extractor.	
2029	Failure to eject. Round in extractor.	
2034	Round at an angle in feedway. Bolt would not go home.	Shell pried out. Possibly long round in belt.
2084	Failure to eject. Gas cylinder plug loose.	Plug tightened.
2112	Bolt would not close.	Shell pried out of belt.
2174	Gun stopped during slow rate burst.	Fired again on pulling trigger. Might be due to man. Was previously reported several times, but rate unknown. Thought due to man trouble, but possibly not.
2214		No trouble.
2224	Actuator occasionally failed to release bolt during slow rate, over last 50 rounds.	Actuator spring removed, stretched and reinstalled.
2392	Barrel #1 installed by accident this p.m. Ruptured cartridge due to headspace.	#9 barrel installed.
2464		No trouble.
2531		Rifle cleaned and oiled.

Authority NND 735022

21 July 1944
Ammunition lot: RA 33019, Grade MC
Loaded in new belts.

Round No. to date	Malfunction	Remarks
		Barrel #9
2532	Failure to eject. Empty cartridge in bolt face. Next round in cartridge extractor. Bullet jammed against rear of chamber. Bolt would not go forward.	Case ejected by hand. Shell pried out of bolt.
2558	11 o'clock stub.	
2559	Failure to eject. Empty cartridge in bolt face. Bullet jammed against edge of chamber.	
2563	Failure to eject. Empty cartridge in bolt face. Bullet jammed against edge of chamber.	
2596	Failure to eject. Empty cartridge in bolt face. Bullet jammed against edge of chamber.	Gas port opened.
2691	Failure to eject.	
2706	Firing single shot when set on slow rate.	
2721	Failed to eject.	
2722	Failed to eject.	
2729		Gas port opened.
2732	Failed to eject.	
2736	Failed to eject. Piston head retaining pin sheared off.	Installed new pin. Installed new firing pin. (Old pin still o.k.) Stripped and inspected trigger group. BAR sear removed and original sear put back.
2741	Failure to eject. Empty cartridge in T slot.	
2742	Failure to eject.	Headspace tightened .002".
2776	Failed to eject.	Ejector and spring from #4 Gun installed on #5.
	6 more failures to eject between RD #2776 and RD #2809	Gas plug installed so port directly under port in barrel. Gun apparently not getting enough gas.
2826	6 o'clock stub. Still not firing automatic at slow rate.	

Authority NND 735022

21 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
2959	Failure to eject. Case in T slot.	
2971	Failure to eject. Broke ejector bumper.	No spare parts. Gun cleaned and oiled.

26-29 July 1944

Capt. Sturtevant, O.D., Springfield Armory, arrived with spare parts and made the following changes:
Installed new ejector bumper.
Modified case extractor to hold rounds in better alignment.
Cleaned carbon from gas plug valve threads.
Modified gas plug valve screw to permit throttling of gas port.
Added slight chamfer to barrel chamber.
Headspaced gun to approximately 1.946
Completely disassembled weapon and inspected. Removed burrs; adjusted wherever necessary.
Replaced gas piston rod and piston

31 July 1944
Ammunition lot: DM 20188, Grade M3

#5 barrel.

2971		Gas port closed.
2972	Bolt would not go forward.	Extractor filed down to provide greater clearance in receiver.
2973	Failure to eject.	Gas port opened to 1/2 turn. Extractor filed down more.
2974	Failure to eject.	Gas port opened to 3/4 turn.
2976	Failure to eject.	Gas port opened to 1 full turn.
2989	Failure to eject.	
3011	Failure to eject	Gas port opened to 1-1/4 turn.
3071	Failure to eject.	
3081	Bolt closed on empty chamber.	Possible short round.
3221		No trouble. Barrel removed easily.

Authority NND 735022

31 July 1944
Ammunition lot: RA 33019

Round No. to date	Malfunction	Remarks
3271	Stopped on slow rate	No apparent reason.
3281	Stopped on slow rate.	No apparent reason.
3351	Misfire - Fired on 2nd attempt.	
3471		No trouble. Barrel removed and cooled.
3556	Failure to eject.	
3561	Failure to eject.	
3626	Failure to eject.	
3721		No trouble.
3963	Piston frozen in cylinder after gun cleared.	
3971		Gun cleaned and oiled.

1 August 1944
Ammunition lot: RA 33032, Grade AC or B
No. 5 barrel M-2 Mount

3974	Bolt failed to release. Runaway of 3-4 rounds on slow rate.	Easily cleared by hand.
4076	Bolt failed to release.	Easily cleared by hand.
4181	Bolt failed to release.	Easily cleared by hand. Extractor filed down for more clearance. Filed rear face of ejector. Put in new sear release spring. Smoothed face of sear release stop lever.
4196	Bolt failed to release.	Easily cleared by hand.
4221		No trouble.
4266	Bolt failed to release.	Easily cleared.
4269	Bolt failed to release.	Filed rear face of ejector.
4325	Failure to eject.	
4343	Failure to eject.	
4345	Failure to eject.	
4356	Failure to eject. Gas plug loose.	Plug tightened.
4363	Bolt failed to release.	Easily cleared.
4401	Bolt failed to release.	

Authority NND 735022

1 August 1944 (Cont'd.)

Round No. to date	Malfunction		Remarks
4403	Bolt failed to release - After round was removed bolt still wouldn't go forward.		
4403			Gun cleaned, oiled and inspected.
4403	Failed to eject.		#9 Barrel, valve opened 1/2 turn.
4404	Failed to eject.		
4407	Failed to eject.		
4410	Failed to eject.		Gun oiled.
4411	Failed to eject.		Port opened to one turn.
4412	Failed to eject.		
4413	Failed to eject.		
4414	Failed to eject.		Gas port at 1-1/2 turn.
4418	Failed to eject.		Gas port at 1-3/4 turn.
4420	Failed to eject.		
4423	Failed to eject.		
4425	Failed to eject.		
4426	Failed to eject.		Gas port at 2-1/4 turn.
4437	Failed to eject.	Bolt failed to release.	Gas port at 3-1/4 turn.
4440	Failed to eject.		
4443	Failed to eject.		Gun cleaned and oiled.

2 August 1944
Ammunition lot: RA 33032, Grade AC or R

		No. 1 Barrel. Gas port opened 1 turn. New ejector placed in No. 5 gun.
4476		No trouble.

3 August 1944
Ammunition lot: RA 33032, Grade AC or R
No. 5 Barrel

4533	Failure to eject.	
4726		No trouble.
4976		No trouble.
5226		No trouble.
5476		No trouble.
5726	Erratic on slow rate.	
5855	Failure to eject.	

Authority NND 735022

3 August 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
5976		No trouble.
5996		Gun cleaned and oiled.

4 August 1944
Ammunition lot: RA 33032, Grade AC or R
No. 5 Barrel

6025	Failed to eject.	
6026	Failed to eject.	Gas port opened 1/4 turn.
6246		No trouble.
6496		No trouble.

Ammunition lot: FA 3817

6746		Gun cleaned and oiled.

Note: During the period 4-8 August, this gun was tried for functioning under a water spray. All rounds are listed in this log, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

6796	1 failure to eject.	Wet belt and ammunition, but gun dry.
6871		Water test to here.
		Gun cleaned and heavily lubricated.

7 August 1944
Ammunition lot: FA 3817, experimental
No. 5 Barrel

6896	Gun giving consistent failures to eject. Ejection weak throughout this group of 25 rounds.	Gas port opened wide. No. 9 barrel installed.
7011		Water test to here.
		Gun cleaned and lubricated.

8 August 1944
This gun giving consistent weak ejection and failures to eject. Barrels changed, various ammunition lots and belts used, other parts changed, gun examined carefully, gun lubricated carefully, but poor ejection continued. Test discontinued.

Total rounds fired in this test: 7100

Authority NND 735022

5. Browning Automatic Rifles

Note: The automatic rifles were being fired with experimental trigger assemblies. Stoppages which were apparently due only to the experimental trigger are not listed here.

aa. Browning Automatic Rifle No. 33712.

Log of Malfunctions and Changes

23 July 1944
Ammunition lot: R.A. 33032, Grade AC or R

Round No. to date	Malfunction	Remarks
100		No trouble.
200		No trouble.
300		No trouble.
400		No trouble.
500		No trouble.
600		No trouble.
		Gun cleaned and oiled.

7 August 1944

Note: This gun was tried for functioning under a water spray. All rounds are listed in this log, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

710		No trouble to here.
800		Water test to here.
		Gun cleaned and oiled.

8 August 1944

910	1 failure to fire.	No other trouble to here.
1260		Water test to here.

Total rounds fired in this test: 1260

Authority NND 735022

bb. Browning Automatic Rifle No. 42432

Log of Malfunctions and Changes

22 July 1944
Ammunition lot: R.A. 33019, Grade AC or B

ound No. e date	Malfunction	Remarks
12	Failure to eject. Round on top of round.	
26	Failure to eject. Round on top of round.	
		Gas port opened.
66	7 o'clock stub.	
80		No trouble.
82	Failure to feed.	
160		No trouble.
206	Failure to feed, magazine.	
215	Failure to extract.	
225	Failure to feed.	
240		No trouble.
278	Failure to eject.	
302	Failure to eject.	
306	Failure to eject.	
309	Failure to eject.	Gas port opened.
311	Failure to eject.	
320	Failure to eject. Insufficient gas.	Set on large port. Gun cleaned.
400		No trouble.
411	Failure to feed, clip.	
428	Failure to eject.	
452	Failure to feed.	
454	Failure to feed.	
456	Failure to extract.	
469	Failure to eject.	
480		Gun cleaned and oiled.

BAR 42432

24 July 1944
Ammunition lot: R.A. 33019, Grade AC or B

546	Failure to eject.	
558	Failure to extract.	

Authority NND 735022

24 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
560		No trouble.
602	Failure to feed, magazine trouble.	
608	Failure to feed, magazine trouble.	
633	Failure to feed.	
640		No trouble.
675	Failure to eject.	
676	Failure to eject.	
677	Failure to eject.	
693-5	Failure to feed, magazine trouble.	
699	Failure to eject.	
709	Failure to eject.	
714	Failure to eject.	
720		All magazines cleaned.
753	Failure to eject.	Gas port opened.
754	Failure to eject.	
755	Failure to eject.	
757	Failure to eject.	Gun oiled.
762	Failure to eject.	
763	Failure to eject.	
769	Failure to eject.	New trigger assembly installed.
794	Failure to feed.	Magazine trouble.
800		No trouble.
853	Failure to feed, magazine trouble.	
854	Failure to feed, magazine trouble.	
855	Failure to feed, magazine trouble.	
856	Failure to feed, magazine trouble.	
862	Failure to feed, magazine trouble.	
878	Failed to eject.	
880	Failed to eject.	
960		No trouble.
1040		No trouble.
1105	Failure to feed.	
1120		No trouble.
1129	Failure to feed.	
1165	Failure to feed.	
1166	Failure to eject.	
1185	Failure to feed, magazine trouble.	

Authority NND 735022

24 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
1186	Failure to feed, magazine trouble.	
1193	Failure to feed, magazine trouble.	
1200		No trouble.
1226	Failure to eject.	
1280		No trouble.
1360		No trouble.
1428	Failure to eject.	
1440		Ceased firing. Gun cleaned and oiled.

25 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

1540		No trouble.
1578	Failure to feed.	
1582	Failure to feed.	
1586	Failure to eject.	
1605	Failure to eject.	Trigger assembly changed.
1620		No trouble.
1700		No trouble.
1780		No trouble.
1790		No trouble.
1860	Failure to eject.	
1870		No trouble.
1872	Failure to eject.	
1942	Failure to eject.	
1943	Failure to eject.	
1944	Failure to eject.	
1945	Failure to eject.	
1946	Failure to eject.	
1950		Gun cleaned.
2030		No trouble.
2062	Failure to eject.	
2110		No trouble.
2124	Failure to eject.	
2133	Failure to eject.	
2161	Failure to eject.	
2190	Failure to eject.	Gun cleaned and oiled.

Authority NND 735022

27 July 1944

Ammunition lot: R.A. 33019, Grade AC or R

ound No. e date	Malfunction	Remarks
		Guns checked and oiled. Magazines checked.
200	Failure to eject.	Medium gas port.
218	Failure to eject.	Changed to small gas port.
290		No trouble.
390		No trouble.
447	Failure to eject.	
484	Failure to eject.	
490	Failure to eject.	
551	Failure to eject.	
590		No trouble.
690		No trouble.
692	Failure to eject.	
764	Failure to eject.	
790		No trouble.
890		No trouble.
891	Failure to feed.	
906	Failure to feed.	
975	Failure to eject.	Changed gas port to medium.
990		No trouble.
014	Gun continues to fire after trigger released.	
020	Failure to eject.	Changed to another trigger mechanism.
090		No trouble.
120	Failure to feed, magazine.	
180	Failure to eject.	
190		No trouble.

Ammunition lot: R.A. 33032, Grade AC or R

		Small gas port.
100	Failure to eject.	
290		No trouble.
296	Failure to eject.	
346	Failure to eject.	
358	Failure to eject.	Changed to medium gas port.
380	Failure to eject.	

Authority NND 735022

27 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
3390		No trouble.
3394	Failure to eject.	
3413	Failure to eject.	
3419	Failure to eject.	Changed to large port.
3451		Changed trigger assembly.
3454	Failure to eject.	
3490		No trouble.
3495	Failure to eject.	Replaced extractor.
3505	Failure to eject	
3515	Failure to eject.	
3515		#2 trigger assembly placed in #1 gun. Gun disassembled for examination. #2 trigger assembly operated o.k. in #1 gun. Gun closely examined for reason of failure to eject. Probable cause: Heavily carboned. Gun cleaned and oiled.

ee. Browning Automatic Rifle No. 631690

Log of Malfunctions and Changes

28 July 1944
Ammunition lot: R.A. 33032, Grade AC or R

100		No trouble.
200		No trouble.
300		No trouble.
400		No trouble.
401	Failed to feed. Magazine not fully seated.	
500		No trouble.
600		No trouble.
		Gun cleaned and oiled.

Note: This gun was tried for functioning under a water spray. All rounds are listed in this log, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

710	4 Failures to fire.	No other trouble to here.
970		Water test to here.

Total rounds fired in this test: 970

Authority NND 735022

dd. Browning Automatic Rifle No. 100161

Log of Malfunctions and Changes

22 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

Round No. to date	Malfunction	Remarks
80		No trouble.
160		No trouble.
240		No trouble.
280		No trouble.
360		No trouble.
440		No trouble.
	Failure to feed	Clip trouble.
520		No trouble.
600		Gun cleaned and oiled.

24, 25, 26 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

3 Failures to feed.

2280 — Approximately 1680 rounds fired with 3 malfunctions.

Record lost.

27 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

Guns checked, oiled. Magazines checked.

2380	No trouble.
2480	No trouble.
2580	No trouble.
2680	No trouble.
2780	No trouble.
2880	No trouble.
2980	No trouble.
3080	No trouble.

Authority NND 735022

7 July 1944 (Cont'd.)

Round No. to date	Malfunction	Remarks
3180		No trouble.
3280		No trouble.
3380		No trouble.
3480		No trouble.
3580		No trouble.
3680		No trouble.
3700		Gun cleaned and oiled.

ee. Browning Automatic Rifle No. 111744

Log of Malfunctions and Changes

28 July 1944
Ammunition lot: R.A. 33032, Grade AC or B

Round No. to date	Malfunction	Remarks
100		No trouble.
170		No trouble.
200		No trouble.
300		No trouble.
400		No trouble.
500		No trouble.
600		No trouble.
		Gun cleaned and oiled.

Note: This gun was tried for functioning under a water spray. All rounds are listed in this log, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

710	1 failure to fire.	No other trouble to here.
990		Water test to here.

Total rounds fired in this test: 990

Authority NND 735022

ff. Browning Automatic Rifle No. 200854

Log of Malfunctions and Changes

28 July 1944
Ammunition lot: R.A. 33032, Grade AC or R

ound No. date	Malfunction	Remarks
100		No trouble.
200		No trouble.
300		No trouble.
400		No trouble.
500		No trouble.
560		No trouble.

Authority NND 735022

6. Light Machine Gun M1919A6. No. 707838

Log of Malfunctions and Changes

22 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

Round No. to date	Malfunction	Remarks
15	Ruptured cartridge.	
30	Ruptured cartridge.	Headspace adjusted.
250		No trouble.
500		No trouble.
700		No trouble.
	Ammunition lot: D.M. 20188, Grade MG	
950		No trouble.
1200		No trouble.
1450	1 stoppage; badly damaged round.	This belt spot checked for damage. Found about same proportion of damaged rounds as in belts used in T23.
		Gun cleaned and oiled.

24 July 1944
Ammunition lot: R.A. 33019, Grade AC or R

1700		No trouble.
	Ammunition lot: D.M. 20188, Grade MG	
1950		No trouble.
1965	Failed to feed (Badly damaged round).	
2200		No trouble.

Authority NND 735022

24 July 1944 (Cont'd.)

Ammunition lot: R.A. 33019, Grade AC or R

Round No. to date	Malfunction	Remarks
2450		No trouble.
	Ammunition lot: D.M. 20188, Grade MG	
2700		No trouble.
		Gun cleaned and oiled.
	25 July 1944	
	Ammunition lot: D.M. 20188, Grade MG	
2950	Two stoppages due to badly damaged rounds.	No trouble.
3200		No trouble.
3450		No trouble.
3700		No trouble.
3950		No trouble.
		Gun cleaned and oiled.
	7 August 1944	

Note: This gun was tried for functioning under a water spray. All rounds are listed in this log, but the malfunctions which occurred while the gun was wet are not listed here. These stoppages are listed in Test No. 15.

4000	No trouble to here.
4175	Water test to here.
	8 August 1944
4625	Water test to here.

Total rounds fired in this test: 4625

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5. Summary of Facts Determined by Test.

The following facts were disclosed by the test:

a. Weight of the T23 is approximately 25 pounds without magazine. (Test No. 1)

b. Except for a few parts, such as stock, carrying handle, etc., the T23, BAR and M1919A6 are made of steel. (Test No. 2)

c. No particular difficulty was encountered in stripping and assembling the T23, nor in teaching these operations. Results are about the same as with the BAR or M1919A4. (Test No. 3)

d. The T23 takes a little more time and a little more manipulation to load or unload. (Test No. 4)

e. Time into and out of action are about the same with the T23, BAR or M1919A6. (Test No. 5)

f. Cyclic rate ranged from 750 to 800 rounds per minute on the fast rate. On the slow rate, gun No. 1 gave a rate of 583 rounds per minute. This gun was erratic, however, and the normal slow rate would be less than that figure. (Test No. 6)

g. Barrels could be changed in approximately 6 seconds. Barrels were difficult to remove as received, but were modified during the test, so that they gave little trouble at the last. (Test No. 7)

h. The gun can be satisfactorily hand carried, except when extremely hot. Sling swivels permit carrying it slung over the shoulder. (Test No. 8)

i. The sighting system appears to be as adequate as that on the BAR. (Test No. 9)

j. The flash hider materially reduces the flash at night. (Test No. 10)

k. The magazine holds approximately 100 rounds and appears to work satisfactorily. (Test No. 11)

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l. The T23 gave slightly better accuracy than the BAR or M1919A6 in single shot and slow rate fire, but poorer accuracy at the fast rate. (Test No. 13)

m. Neither the T3E3 nor the M2 tripod appeared to be ideally suited to the T23, although the gun could be mounted on either tripod. (Test No.14)

n. Generally, the T23 guns did not perform well when under a water spray. Failures to eject were numerous. However, at this same time the guns were not functioning well when dry. (Test No. 15)

o. A large number of malfunctions were obtained with the T23 guns. Fewer malfunctions were obtained with the BAR or M1919A6. (Test No. 16)

6. Test Officer's Discussion.

a. It should be noted that the weight of the T23 has been increased to approximately 25-26 pounds, or about 5-6 pounds more than the BAR and 7-8 pounds less than the production model M1919A6.

b. As received, the guns did not behave well. The gas valve in the cylinder did not affect the power of the gun, due to improper manufacture. The barrels were difficult to remove when hot and general functioning was poor. As the result of constant filing and altering, some difficulties were eliminated, but general functioning still remained only fair. While Capt. Sturtevant was observing, No. 5 gun gave consistent short recoil on one day. Ammunition was changed, gun was carefully examined, parts were changed and gun was thoroughly lubricated, without curing the difficulty. The next day, however, the gun performed reasonably well. Just prior to and during the water test, all four guns were giving short recoil, failures to eject and weak ejection. All attempts to discover the cause or a cure failed. Consequently, functioning under the water spray was generally poor. Inasmuch as the guns were not functioning satisfactorily under normal conditions it was not believed desirable to try them under poor conditions such as mud and dust.

c. The gun appears to be unduly sensitive to variations in ammunition, variations in belt loading and to off-line feeding of the belt into the feedway.

I concur in the above report:

EDWARD B. CROSSMAN,
Major, Infantry,
Test Officer.

WILLIAM P. O'NEAL, Jr.,
Major, [illegible], Infantry,
Chief of Test Section.